CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME

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DR. ARPIT VARSHNEY

SUPERVISOR

DR. SANDEEP PURI

DEPARTMENT OF MEDICINE
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA
(MAY, 2021)

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I declare that the thesis entitled **"CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME"** has been prepared by me under the guidance of **Dr. Sandeep Puri**, Professor, Department of Medicine, Dayanand Medical College and Hospital, Ludhiana. No part of this thesis has formed the basis for the award of any degree previously.

_____

DR. ARPIT VARSHNEY
Department of Medicine
Dayanand Medical College & Hospital
Tagore Nagar
Ludhiana-141001
Punjab

Date:

CERTIFICATE

I certify that D**r. Arpit Varshney** has prepared his thesis entitled **"CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME"** for the award of degree of M.D. in Medicine of Baba Farid University of Health Sciences, under my guidance. He has carried out the work at the Department of Medicine, Dayanand Medical College & Hospital, Ludhiana.

Supervisor

Dr. Sandeep Puri
Professor
Department of Medicine
DMCH, Ludhiana

Co-Supervisor

Dr. Birinder S Paul
Professor
Department of Neurology
DMCH, Ludhiana

Dr. Rajnish Garg
Professor & Head
Department of Orthopaedics
DMCH, Ludhiana

Date:

ENDORSEMENT BY THE HEAD OF THE DEPARTMENT AND PRINCIPAL

This is to certify that the thesis entitled **"CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME"** is a bonafide research work done by **Dr. Arpit Varshney** under the guidance of **Dr. Sandeep Puri**, Professor, Department of Medicine, Dayanand Medical College & Hospital, Ludhiana.

Head of Department

Dr. Dinesh Gupta
Professor & Head
Department of Medicine
DMCH, Ludhiana

Principal

Dr. Sandeep Puri
Principal
DMCH, Ludhiana

Date:

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Dr. Arpit Varshney
Department of Medicine
Dayanand Medical College & Hospital
Tagore Nagar
Ludhiana-141001
Punjab

Date:

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Faridkot

Dedicated

to

my Family

&

teachers

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ABBREVIATIONS

CTS	Carpal Tunnel Syndrome
BMI	Body Mass Index
USG	Ultrasonography
MRI	Magnetic Resonance Imaging
NSAIDs	Non Steroidal Anti Inflammatory Drugs
CTR	Carpal Tunnel Release
OR	Odds Ratio
CI	Confidence Interval
NCV	Nerve Conduction Velocity

ABSTRACT

INTRODUCTION- Carpal tunnel syndrome(CTS) is a common condition that causes pain, numbness and tingling in the hand and arm. The condition occurs when median nerve is squeezed or compressed as it travels through the carpal tunnel in wrist.

AIM OF STUDY- Study the clinical profile in patients with carpal tunnel syndrome

MATERIALS AND METHODS- This was a prospective observational study conducted in patients with CTS on NCV studies in Dayanand Medical College and Hospital, Ludhiana. Subjects with diagnosis of CTS on NCV studies were included. Demographic profile, clinical history, detailed occupational history were evaluated. All subjects were evaluated for phalen test, tinel sign, durken test and associated comorbid conditions. Based on NCV, severity of CTS was classified as mild or moderate to severe.

RESULTS- Of the 200 patients with 340 wrists having CTS, mean age of presentation was 49.73 ± 10.9 years in our cohort with 149 females(74.5%) and 51 males(25.5%) and >50% had BMI>25kg/m2. The non-skilled workers group constituted the major bulk(N=115,57.5%). 78 cases were drivers, 49 cases had constant writing job, 35 cases had computer related profession, and 65 cases were doing manual cow milking. In cow milkers with CTS, female:male ratio was 7.12 with bilateral disease being more common. There were 22 cases(11%) with fracture who developed CTS on the same side. Sensitivity of phalen test, tinel sign, durken test was 72.6%, 10.3% and 29.1% respectively.

CONCLUSION- Elderly age, female gender with high BMI are commonly associated risk factors for CTS. Driving, computer use and cow milking were additional risk factors for CTS in our cohort. Comorbid conditions lead to bilateral and moderate to severe CTS. Early recognition, control of risk factors and prompt treatment is the key to managing CTS. People involved in cow milking should be counseled about possible complications including CTS and preventive mechanisms for the same. There is a need to develop alternative mechanical milking machines in order to prevent such complications. Alternatively, cow milkers should perform manual milking in shifts with regular breaks.

KEY WORDS- carpal tunnel syndrome, female, BMI, computer use, cow milking, diabetes.

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INTRODUCTION

Carpal tunnel syndrome(CTS) is a neurological condition that causes pain, numbness, and tingling in the hand and arm. Carpal tunnel syndrome occurs when median nerve in the arm is squeezed or compressed during its course through the wrist. It occurs when the tissues surrounding the flexor tendons (synovium) swell or tunnel becomes narrowed, putting pressure on the median nerve. When the synovium swells, it takes up space in the carpal tunnel and, over time, crowds the nerve. This pressure on the nerve can result in numbness, tingling, pain and weakness in the hand.

Carpal tunnel syndrome is the most common entrapment neuropathy affecting approximately 3 to 6 percent of adults in the general population.[1] The mean annual crude incidence of carpal tunnel syndrome is found to be 329 cases per 100,000 person-years, and the standardized incidence was 276.[2] It has a prevalence in the general adult population ranging from 2.7 to 5.8 percent.[3,4]

Carpal tunnel syndrome is rarely diagnosed before the age of 30, and 76% of all patients become symptomatic between the age of 40 and 70.[5]

There are striking gender disparities in CTS rates. Overall, three times more women suffer from CTS than men.[6] Those individuals who were classified as obese (BMI > 29) were 2.5 times more likely than slender individuals (BMI < 20) to be diagnosed with CTS. 43% of obese women and 32% of obese men had the diagnosis of CTS compared to 21% of slender women and 0% of slender men.[7]

There are multiple risk factors associated with carpal tunnel syndrome. Elderly age, Female gender, higher BMI, repetitive hand use (driving, typing, writing), fractures of arm, arm surgeries, diabetes, hypothyroidism, rheumatoid arthritis, hypocortisolism , pregnancy are some common risk factors which are associated with carpal tunnel syndrome.A significant association between CTS and hand force, repetition, use of vibratory tools and wrist posture has been observed.[8]

Typing for long hours is a significant risk factor for developing carpal tunnel syndrome. Carpal tunnel pressure is influenced by wrist posture during typing and, independently, by the act of typing.[9] Even in Indian subcontinent, higher risk for CTS was found with higher exposure to computer work.[10]

In India, prolonged computer use, embroidery workers, cow milkers, dentists are found to have an association with carpal tunnel syndrome. Chikan embroidery is a hand-intensive occupation involving repetitive use of hands and wrists and population involved is at risk of experiencing CTS.[11] Cow milkers, due to repetitive movement of both hands, are at increased risk of developing carpal tunnel syndrome. The prevalence of carpal tunnel syndrome is higher in dental professionals involved in various aspects of dental specialties.[12] Carpal tunnel syndrome is associated with dentists who reportedly work longer hours with improper hand-wrist position and improper operator and chair positions.[13]

Fractures of the arm are known to cause carpal tunnel syndrome as a late complication. Carpal tunnel syndrome is a well-recognized phenomenon following a distal radius fracture.[14] Diabetes is a known risk factor for carpal tunnel syndrome. Both Type 1 and Type 2 diabetes are risk factors for carpal tunnel syndrome.[15] Diabetes is a major risk factor in the development of both Carpal tunnel syndrome and ulnar nerve entrapment.[16] Carpal tunnel syndrome is a common entity in patients with hypothyroidism. The prevalence of clinical and paraclinical symptoms of CTS is relatively high in hypothyroid patients.[17] Carpal tunnel syndrome is the most common compression neuropathy associated with rheumatoid arthritis.[18]

There is an increased risk of developing carpal tunnel syndrome during pregnancy owing to increased fluid collection in pregnancy. Prevalence of CTS in pregnant women is significant.[19] CTS is prevalent in the third trimester of pregnancy. Yet, this troublesome complication of pregnancy appears to be under-recognised, with most patients not being treated appropriately.[20]

The common presenting clinical features of carpal tunnel syndrome include pain, numbness, tingling and paraesthesia along the median nerve distribution of the hand. Nevertheless, the past medical history and physical examination plays a predominant role in clinical diagnosis.[21]

Provocative testing in carpal tunnel syndrome has a pivotal role. The basic mechanism of the pressure provocative tests works on ‘double crush hypothesis’ which states that a compromised nerve already has a lower threshold to mechanical pressure as compared to an uncompromised nerve, so any additional pressure will cause symptoms of nerve compression readily when compared to the response of additional pressure on a normal nerve. Phalen test works on the principle that Flexion of the wrist causes compression of the nerve between the transverse carpal ligament and flexor tendons in the carpal tunnel, causing paraesthesia in the median nerve distribution reproducing the patient's symptoms. It is performed by having the patient hold the forearm vertically with the elbows resting on the table and then allowing both hands to drop with complete wrist flexion for approximately one minute. The test is considered positive when paraesthesia develops within one minute. Patients with advanced CTS often note paraesthesia in less than 20 seconds.[22] In Tinel sign testing, examiner taps lightly over the site of the median nerve at the distal wrist crease of the patient’s forearm. Occurrence of tingling or discomfort in the fingers supplied by the median nerve denotes a positive sign. In Durkan test, Examiner presses his thumb over the carpal tunnel area of the patient and holds the pressure for 30 seconds. Onset of pain or paraesthesia in the median nerve distribution in less than 30 seconds is positive durkan sign.

Nerve conduction studies are the gold standard test for diagnostic confirmation of CTS. Electrophysiological studies confirm the early diagnosis of CTS with a high degree of sensitivity.[23] But they have certain limitations. A small percentage of asymptomatic patients can have positive test. Similarly, a small percentage of individuals can have negative Nerve Conduction Study despite having symptoms of CTS.

Nerve conduction studies and Electromyography have a key role in diagnosis as well as in quantifying and stratifying the disease severity. Nerve conduction studies provide a reliable measure to document median neuropathy at wrist and therefore contribute to the diagnosis of CTS.[24] Other investigations that are employed in diagnosis of carpal tunnel syndrome include USG and MRI. Nerve conduction studies remain gold standard but USG and MRI help increase sensitivity and detect mass lesions amenable to surgery.[25]

Treatment of carpal tunnel syndrome is based on severity of the disease. Mild to moderate cases have normal to mildly abnormal nerve conduction study and electromyography findings. Conservative treatment of 6 weeks to 3 months is preferred in patients with mild disease. NSAIDs like naproxen, ibuprofen, indomethacin etc are used for symptomatic relief from pain in mild to moderate cases. Diuretics are useful in conditions which cause fluid retention and oedema ultimately causing carpal tunnel syndrome. Cock-up and neutral wrist splints along with oral steroids are used as first-line therapies. Local corticosteroid injections are used for refractory symptoms not responding to first line treatment. Worsening clinical symptoms and abnormal electrodiagnostic studies suggest severe disease. Patients with moderate to severe disease, or those with persistent symptoms despite conservative treatment, may be considered for surgical treatment. The surgical procedure performed is called a “carpal tunnel release”. It can be an open carpal tunnel release or endoscopic carpal tunnel release. In most cases, carpal tunnel surgery is done on an outpatient basis. The surgery can be done under general anaesthesia or under local anaesthesia.

The incidence and prevalence of Carpal tunnel syndrome is on a rise in developed as well as developing countries. Hence we conducted a prospective study to establish the association of carpal tunnel syndrome with various physical and biological parameters, day to day activities, common illnesses and to find out the importance of history, clinical examination and provocative testing in relation to carpal tunnel syndrome.

AIMS AND OBJECTIVES

To study clinical profile in patients with carpal tunnel syndrome.

REVIEW OF LITERATURE

Carpal tunnel syndrome is characterized by Pain, numbness, tingling, paraesthesia in the hands along the distribution of median nerve. It is a continuously evolving disease with high morbidity. Despite recent advances in diagnostic and treatment modalities, the incidence of carpal tunnel syndrome is still increasing day by day. Carpal tunnel syndrome incidence is on a rise even in developing countries.

HISTORY

Sir James Paget (1854) was the first to describe the clinical features of CTS. His first patient was a man who developed pain and impaired sensation in the hand from the trauma of a cord drawn tightly around his wrist(26). But it was only a century later that the term "carpal tunnel syndrome" (CTS) appeared in print. Until then, patients with symptoms, which we now know were due to CTS, were sometimes diagnosed as having acroparaesthesia, and at other times compression of the motor branch of the median nerve or the brachial plexus.[27] In 1938, the term “carpal tunnel syndrome” (CTS) was coined by Moersch.[28] However, CTS became a prominent and well known disease after a series of articles written by George Phalen beginning in 1950.

EPIDEMIOLOGY

In developed world, Carpal tunnel syndrome is the most common entrapment neuropathy affecting approximately 3 to 6 percent of adults in the general population.[1] However, the data for incidence of carpal tunnel syndrome in developing countries is limited. Mondelli et al[2] conducted an 8 year long prospective study in Italy and found that mean annual crude incidence was 329 cases per 100,000 person-years, and the standardized incidence was 276.

CTS has a prevalence in the general adult population ranging from 2.7 to 5.8 percent.[3,4] In 2001,Papanicolaou et al[29] studied the prevalence of carpal tunnel syndrome and concluded that CTS prevalence in the general US population is 3.72%. Data for incidence and prevalence of carpal tunnel syndrome in Indian subcontinent is not available.

However, India has seen a rise in cases of carpal tunnel syndrome in recent years.

DEMOGRAPHY

Carpal tunnel syndrome has a bimodal age distribution with a peak between ages 50–54 years, and a second peak between 75–84 years. Blumenthal et al[30] conducted a prospective study in 2002-2003 and examined age differences in clinical, functional, and electrophysiologic features in elderly adults referred for evaluation to a neuromuscular service for evaluation of symptoms suggestive of CTS. They found that, of the 343 eligible subjects, there were 158 young (≤50 y), 115 middle-aged (51–64 y), and 70 older adults (≥65 y). The mean ages of these groups were 40, 56, and 75 years, respectively. There were no differences in self-reported height or weight. There were more men in the older group than the young group, though the difference was not significant (19% vs. 8%, p=0.04).

Wenjie guan et al [31] studied the characteristics of the risk factors of carpal tunnel syndrome (CTS) in Chinese population. CTS of 1,512 outpatients aged 41–70 years who were without any other diseases which could cause numbness as a case group, and 4,536 non-CTS outpatients as a control group were involved in the study in 2013–2014. Both groups received a questionnaire and the case group received another electrical physiological examination. The results indicated that 51–60 years of age in this study was the highest risk age group.

Carpal tunnel syndrome is known to be a female predominant disease. It is twice more common in women than men. However, recent studies showed that male are equally affected with carpal tunnel syndrome than female but are underdiagnosed as males tend to seek medical care when symptoms become very severe.

In 1997, Padua et al[32] conducted a study to determine the prevalence of carpal tunnel syndrome in male. They concluded that fewer men than women are diagnosed with CTS in population-based surveys, while prevalence rates among men and women who perform the same tasks are similar. Men may seek medical attention only when CTS symptoms become severe, thus, less severe cases remain

undiagnosed and recorded prevalence rates remain lower, or physicians may interpret symptoms related to CTS differently in men and women. Hence, the occurrence of CTS in the male population is underestimated.

With evolving medical diagnostic modalities and increasing awareness among common population, the incidence and prevalence of carpal tunnel syndrome is increasing and the age and gender pattern of occurrence of the disease has seen a drastic shift in past few years.

RISK FACTORS

There are multiple risk factors which predispose a patient to developing carpal tunnel syndrome. Physical parameters include Age, Height, Weight, Gender, Obesity, BMI, small carpal tunnel (genetic factor). Secondly, there is a proven occupational association of carpal tunnel syndrome as well. Occupations which include long hours of writing, driving, computer use are notorious for developing carpal tunnel syndrome. Carpal tunnel syndrome is a common finding in dairy workers who do cow milking for long hours. Other risk factors include fractures of the arm especially radius fractures. Lastly, systemic diseases like diabetes, hypothyroidism, rheumatoid arthritis, hypocortisolism also have established association with carpal tunnel syndrome. Pregnancy alone is a strong, independent risk factor for carpal tunnel syndrome.

Advancing Age is associated with increased incidence of carpal tunnel syndrome. In 2013, Komurcu et al [33] investigated the relationship between the CTS severity evaluated by electrophysiological measurements and age, gender, BMI, hand wrist circumference, and waist circumference measurements. CTS severity among the age group of 18–35 years were significantly lower compared to patients between the ages 36–64 and above 65 years. After the BMI correction, this significance persisted. When the reference group of 18–35 years was taken, the CTS development risk was found to have increased 1.86 times for 36–64 age group ($p = 0.025$), and 4.17 times for age 65 and higher ($p = 0.001$). According to these findings it was determined that aging increases CTS risk independent of BMI.

Bland et al[34] conducted a 10 year long study from 1991 to 2001 to study the demographic characteristics of patients with carpal tunnel syndrome and changes in incidence over time. He found out that the age distributions in their study were bimodal with a peak in the 50-54 year age group and a second peak between 75 and 84 years.

Females gender has a strong association with carpal tunnel syndrome. Females are more prone to develop CTS as compared to males. Sharief et al [35] conducted a study in kerala, India between 2017-2018 with the aim to identify the risk factors responsible for carpal tunnel syndrome, to identify the symptom severity as well as functional status of patients with carpal tunnel syndrome, and to determine the relationship between symptom severity and functional status among patients with carpal tunnel syndrome. Among the 100 patients with CTS, it was identified that 64 (64%) were female subjects, 8 (8%) had a family history of CTS, only 9 (9%) had an injury to the upper limb, and 75 (75%) were having comorbidities, of which 53 (53%) had diabetes mellitus, 25 (25%) had hypertension, 24 (24%) had dyslipidaemia, 8 (8%) had osteoarthritis, and 10 (10%) had a thyroid disease.51 (51%) of the participants were overweight. They concluded that female gender is a strong risk factor for carpal tunnel syndrome and prompt recognition, timely management, avoidance of risk factors responsible for the manifestations of carpal tunnel syndrome have practical implications in the treatment of carpal tunnel syndrome.

In 1998, Lam et al[36] studied the association of obesity, gender, age and occupation in patients with carpal tunnel syndrome (CTS) in a New Zealand population. The age and gender distribution of 655 hands (512 patients) that had undergone carpal tunnel release were compared with the age and gender distribution of the New Zealand population. The results indicated that the 3-year-period prevalence of CTS in females is more than double of that in males. Proportionally, there were more patients over age 55 than in the general population. They concluded that Carpal tunnel syndrome is more than twice as common in females as it is in males, and patients aged more than 55 years are more likely to suffer from CTS.

Mansoor et al[37] conducted a cross sectional study in 2016 to determine the frequency of obesity among CTS patients in the neurophysiology department of a tertiary care centre in Islamabad, Pakistan. A total of 112 patients with a mean age of 54 ± 5 years were included in the study. In the study population, 39 patients (35%) were males and 73 were females (65%). Based on BMI, 74 patients (66%) had a normal weight and 38 (34%) were obese. The frequency of obesity in this study was 34%, excluding the other comorbid conditions, which is quite high. They concluded that Targeted therapy in those with CTS should also include weight reduction measures because obesity poses a cause-and-effect relationship for both the severity and the pathogenesis of CTS.

A meta-analysis by Shiri R et al[38] included 58 studies, consisting of 1,379,372 individuals. Overweight participants increased the risk of CTS or CTR 1.5 fold (pooled confounder-adjusted odds ratio (OR) = 1.47, 95% CI 1.37-1.57, N = 1,279,546) and obesity twofold (adjusted OR = 2.02, 95% CI 1.92-2.13, N = 1,362,207). Each one unit increase in BMI increased the risk of CTS by 7.4 percent (adjusted OR = 1.074, 95% CI 1.071-1.077, N = 1,258,578).

Carpal tunnel syndrome has been evolving as an occupational disease. Many occupations have been found to be associated with carpal tunnel syndrome. Occupations which involve prolonged wrist use like driving (truck drivers, cab drivers), writing(teachers), typing or computer use(accountants, bankers), cow milkers, carpenters are at increased risk of developing carpal tunnel syndrome.

A meta-analysis by Hagberg et al [39] in 1992 was done in which epidemiologic studies on carpal tunnel syndrome (CTS) (15 cross-sectional studies involving 32 occupational or exposure groups and 6 case-referent studies) were reviewed. The prevalence of CTS in the different occupational groups varied between 0.6 to 61%. The highest prevalence was noted for grinders, butchers, grocery store workers, frozen food factory workers, platers, and workers with high-force, high-repetitive manual movements. On the basis of epidemiologic and other evidence, it was concluded that exposure to physical work load factors,

such as repetitive and forceful gripping, is probably a major risk factor for CTS in several types of worker populations. At least 50%, and as much as 90%, of all of the CTS cases in these exposed populations appeared to be attributable to physical work load.

Another study by Barcenilla et al [8] in 2012 was done to examine the association between work place exposure and CTS by meta-analysis, including analysis with respect to exposure to hand force, repetition, vibration and wrist posture. A significant positive association between CTS and hand force, repetition, use of vibratory tools and wrist posture was observed with approximate doubling of risk for all exposures. Risk factors significantly associated with an increased risk of CTS among exposed workers were: vibration [odds ratio (OR) 5.40; 95% CI 3.14, 9.31], hand force (OR 4.23; 95% CI 1.53, 11.68) and repetition (OR 2.26; 95% CI 1.73, 2.94).

In 1999, Latko et al [40] conducted a study to determine the relationship of repetitive work and other physical stressors with prevalence of upper limb discomfort, tendinitis, and carpal tunnel syndrome. 352 workers from 3 companies participated. Job exposure levels for repetition and other physical stressors were quantified using an observational rating technique. They found that repetitiveness of work was significantly associated with symptoms consistent with carpal tunnel syndrome (OR = 1.16 per unit of repetition; OR = 2.32 for high vs. low repetition). An association was also found between repetitiveness of work and carpal tunnel syndrome, indicated by the combination of positive electrodiagnostic results and symptoms consistent with carpal tunnel syndrome (OR = 1. 22 per unit of repetition; OR = 3.11 for high vs. low repetition). They concluded that repetitive work is related to upper limb discomfort, tendinitis, and carpal tunnel syndrome in workers.

In 2003, Chin-Wei Liu et al [41] conducted a study to assess the incidence of CTS in a group of computer workers by typical symptoms, median nerve conduction studies, and their combinations. 45 subjects (mean age, 38.8 +/- 7.8 years) who used a computer for more than 6 hours daily in a medical centre in southern Taiwan were studied. All completed questionnaires to ascertain their age, employment duration,

dominant hand, and the severity of symptoms. Physical examinations (tinel's sign and phalen's test) were performed by a physician. The maximal wrist extension angle when typing on a computer keyboard was also measured by the same physician. Nerve conduction studies were performed on each subject to determine the severity of CTS. Results showed that the incidence of CTS in the computer workers was 16.7% (15 of 90 hands). The severity of clinical symptoms was compatible with the findings of the nerve conduction studies. Among the major predisposing factors, they found significant correlation between CTS development and the wrist extension angle while typing on a computer keyboard. Computer workers who kept their wrists extended by more than 20 degrees were at greater risk of developing CTS.

In 2006, KM Ali et al [10] conducted a study in india to assess the prevalence of CTS among computer professionals and risk factors. 648 subjects were selected from 4,276 computer professionals from 21 companies. CTS was diagnosed based on clinical features. The prevalence of CTS was found to be 13.1% (95%).Subjects with over 8 years of computer work, over 12 hrs of work per day and system administrators were at a higher risk for CTS (OR 3.3, 4.9 and 2.5 respectively). Flexed or extended hand position had higher risk for CTS. They concluded that higher risk for CTS was found with higher exposure to computer work and ergonomic considerations are important in facilitating proper positioning of hand while working with a computer.

S. Abichandani et al [12] conducted a meta-analysis in India to assess correlation between dentists and occurrence of carpal tunnel syndrome. They found that prevalence of carpal tunnel syndrome is higher in dental professionals involved in various aspects of dental specialties. They concluded that dentists have an increased risk of carpal tunnel syndrome and precautions and care should be exercised to prevent detrimental irreversible changes.

Y Mamatha et al [13] et al conducted a study in 2005 in Chennai, India to assess the prevalence of Carpal tunnel syndrome related symptoms

in 300 dentists with a high occupational exposure. A 10 question response form was developed and circulated among 300 dentists. 96 out of the 300 (32%) reported to have symptoms of carpal tunnel syndrome. They concluded that carpal tunnel syndrome is associated with dentists who reportedly work longer hours with improper hand-wrist position and improper operator and chair positions.

Dairy workers especially manual cow milkers (milkmen) are frequently found to suffer from carpal tunnel syndrome. Kouyoumdjian et al [42] conducted a study in which 43 cases (1.38%) which were associated with manual milking were selected out of 3125 consecutive patients who had electrodiagnosis of carpal tunnel syndrome from 1989 to 2004. They found that the mean age was 44.9 years and 88.4% were male. The mean time in the milking profession was 247 months; the mean daily milking time was 146 minutes. Median nerve motor distal latency was more affected than the sensory distal latencies and the electrophysiological abnormalities were found to be symmetric. They concluded that Manual milking could be a natural model for occupational CTS. In contrast to idiopathic CTS, there was a greater involvement of motor fascicles; this finding is remarkable for CTS.

In 2009, Kutluhan et al [43] conducted a study to investigate the frequency of CTS among people who are manually milking their animals. 160 hands of 80 women dealing with manual milking (manual milking group) and 40 hands of 20 healthy unemployed women (control group) were clinically and electrophysiologically evaluated for CTS. CTS was diagnosed by physical examination and electrophysiologic test in 41.25% and 37.5% of hands dealing with manual milking respectively. However, only 5% of the control hands had CTS. Clinically and electrodiagnostically estimated relative risks of developing CTS were respectively 13.34 and 11.40 times greater in manual milking group than controls. CTS frequency was increased with age, and correlated with starting age of milking. Thus, they concluded that that manual milking may be a risk factor for CTS development.

In 2012, Anuja Patil et al [44] studied the prevalence of carpal tunnel syndrome (CTS) among dairy workers. Sixty-six dairy parlor workers

and 58 non-parlor workers at dairies in Texas, New Mexico, and Colorado participated in structured interviews regarding demographics, work history, and hand symptoms. All participants had nerve conduction studies performed on both hands across the carpal tunnel. The prevalence of CTS among the dairy parlor workers was 16.6% and 3.6% among non-parlor workers. The difference was found to be statistically significant ($p < 0.05$) with an odds ratio of 5.3. They concluded that CTS is a significant challenge for dairy parlor workers. The prevalence of CTS was found to be significantly higher among dairy workers performing tasks in the milking parlor as opposed to workers performing tasks in other areas of the dairy farm.

Oktem et al [45] conducted a study to investigate the relationship between manual milking and CTS. 35 cases that were associated with manual milking were included in the study out of 805 cases who were diagnosed with carpal tunnel syndrome with nerve conduction studies in 2015 from April to September. They found that all of the patients were female and the mean age was 54.2±12.35. There was a statistically significant difference between severity of CTS and total milking time. Negative correlation was detected between manual milking time and sensory nerve amplitudes, sensory nerve conduction velocities. Positive correlation between motor distal latency and manual milking time and negative correlation between manual milking time and compound muscle action potential and motor nerve conduction velocity was detected. They concluded that manual milking may represent a risk factor for CTS, mainly in areas where milking machines are not in common use. The severity of CTS may increase due to cumulative effect of repetitive trauma in manual milking.

From 2008 to 2010, Lima et al [46] conducted a study to evaluate the prevalence of carpal tunnel syndrome among bovine manual milking workers in a city of the countryside of the State of Parana. 92 patients diagnosed with carpal tunnel syndrome were selected. Among these, 41 participants (44.6%) had performed manual milking in some period of life, being 36 females (39.1%) and 5 males (5.4%). This study showed high frequency of carpal tunnel syndrome among workers

dealing with manual milking, and suggests the expansion of bovine milk production mechanization to prevent carpal tunnel aggressions.

Heba Allam et al [47] conducted a study in 2017 to determine the prevalence and severity of CTS among farmers who performed hand-milking task of cattle and correlated these findings with working years and work duration per hours. Electrophysiological studies were done for 240 female farmers, where half of them were milking their cattle manually and the other half were used as control. Both groups were matched for age, and Body Mass Index (BMI). The prevalence and clinical severity of CTS were significantly higher among female farmers who milk their cattle than non milkers in both hands ($p<0.001$), The median nerve motor and sensory conduction study was significantly higher among milkers than non milkers farmers ($p<0.001$). The electrophysiological findings were significantly correlated with the longer years of work and longer working hours. These findings suggest that CTS is a significant occupational health issue for farmers that continue the traditional methods of manual milking.

Carpal tunnel syndrome is a known entity complicating forearm fractures, more commonly colle's fracture (fracture distal end of the radius. H Aro et al(48) conducted a study to establish occurrence of neuropathies after colles' fracture. They found Conservative management of 166 colles' fractures was associated with a 12% rate of late compression neuropathies (mean follow-up period, 28 months). Compression of the median nerve (8%) was twice as common as ulnar nerve compression (4%).

There are multiple systemic illness which are associated with carpal tunnel syndrome. These include Diabetes, hypothyroidism, rheumatoid arthritis, hypocortisolism etc. The basic pathophysiology behind developing carpal tunnel syndrome in patients with these illnesses is retention of excess fluid in the body leading to increased pressure in the carpal tunnel. Pregnancy, working on same mechanism, also predisposes the patient to carpal tunnel syndrome.

Karpitskaya et al [49] conducted a retrospective case-control study in 2002 to evaluate the prevalence of personal factors in patients with

CTS compared with a normal control group. The charts of 514 patients who underwent a carpal tunnel release procedure and 100 control subjects were examined for history of smoking, obesity, diabetes, and hypothyroidism. There were more CTS patients than control subjects who were obese (p = 0.02; odds ratio, 1.77), had diabetes (p = 0.03; odds ratio, 3.02), and had hypothyroidism (p = 0.02; odds ratio, 3.70). These results suggest that CTS is a multifactorial disease with factors such as obesity, hypothyroidism, and diabetes to be more prevalent in this group of CTS patients.

Becker et al [50] conducted a study in 2002 to identify gender, high body mass index (BMI), age and diabetes mellitus as independent risk factors for carpal tunnel syndrome. 791 CTS cases and 981 controls were enrolled. Patients were selected from those referred to nerve conduction studies and electromyography in 3 university hospitals and two private services. They found female gender, BMI>30, age of 41-60 years and diabetes were significantly more frequent in the case group. They concluded that female gender, obesity and age are independent risk factors for CTS. Diabetes may be a weak risk factor, especially among women.

Another study, a Meta-analysis, was conducted by Pourmemari et al[15] in 2016 to assess whether diabetes increases the risk of carpal tunnel syndrome and to estimate the magnitude of the association with Type 1 and Type 2 diabetes. A total of 36 studies (8 cross-sectional, 21 case-control and 7 cohort studies) from 1950 to January 2015 were included. The pooled odds ratio of 25 studies (including a total of 92,564 individuals) that reported unadjusted estimates for the association between diabetes and carpal tunnel syndrome or carpal tunnel release was 1.97. The pooled odds ratio of 18 case-control or cohort studies consisting of >37 million individuals that reported estimates after controlling for potential confounders was 1.69. They concluded that both Type 1 and Type 2 diabetes are risk factors for carpal tunnel syndrome.

In 2016, Karne et al [51] studied clinical profile of carpal tunnel syndrome in patients with primary hypothyroidism. Adult patients with

diagnosis of primary hypothyroidism were included in this study. Detailed medical history was obtained and all patients underwent clinical examination and nerve conduction study by electrophysiological method. They found that hypothyroidism is shown to be associated with high prevalence and incidence of CTS. Increase in BMI is an important risk factor for CTS in hypothyroidism and clinical evidence of CTS is a very sensitive parameter for the same.

However, a Meta-analysis conducted by Shiri R et al [52] found only modest association between hypothyroidism and CTS. This study aimed to assess the magnitude of the association between hypothyroidism and carpal tunnel syndrome (CTS). 18 studies were included in a random-effects meta-analysis. A meta-analysis of the studies that did not control their estimates for any confounder showed an association between a thyroid disease (hypo- or hyperthyroidism) and CTS (N = 9,573, effect size [ES] = 1.32 [95% confidence interval CI, 1.04-1.68]) and between hypothyroidism and CTS (N = 64,531, ES = 2.15 [95% CI, 1.64-2.83]). When a meta-analysis limited to the studies that controlled their estimates for some potential confounders, the association between a thyroid disease and CTS disappeared (N = 4,799, ES = 1.17 [95% CI, 0.71-1.92], I(2) = 0%), and the effect size for hypothyroidism largely attenuated (N = 71,133, ES = 1.44 [95% CI, 1.27-1.63], I(2) = 0%).

Shiri R et al [53] conducted another meta-analysis study to assess whether Rheumatoid arthritis and Osteoarthritis increase the risk of CTS. 23 studies were included in this research. They found that both Rheumatoid arthritis and Osteoarthritis were associated with CTS. Pooled unadjusted odds ratios (ORs) were 1.91 [95% confidence interval (CI) 1.33-2.75, I(2) = 55.2%, nine studies, n = 10,688] for arthritis (either inflammatory or degenerative), 2.91 [95% CI 2.33-3.62, I(2) = 22.3%, 11 studies, n = 74,730] for Rheumatoid arthritis. They concluded that both rheumatoid arthritis and Osteoarthritis increase the risk of CTS.

JS Gould et al [54] studied Occurrence of the carpal tunnel syndrome in pregnancy by examining 100 consecutive obstetric admissions. 21

patients reported paraesthesias or hypesthesia in the median nerve sensory distribution of the hand during the pregnancy; 8 of these had decreased sensation subjectively at the time of examination 1-3 days after delivery; 2 had trophic changes, loss of motor function, thenar atrophy, and decreased two-point discrimination; and 1 had a delay in motor conduction time across the carpal tunnel. They concluded that the incidence of symptoms of CTS in pregnancy is probably greater than usually appreciated, but that only few patients require treatment.

M H Bahrami et al [19] conducted a study to evaluate frequency and severity of CTS in pregnancy. In this study, 100 pregnant women were evaluated by hand symptoms, CTS provocation tests (tinel sign and phalen test) and for definite diagnosis of CTS standard electrodiagnostic studies were used. Results indicated that prevalence of CTS in pregnant women was significant. Although hand signs and symptoms are useful, electrodiagnostic studies are more reliable.

In 2013, Breborowicz et al [55] performed a study to determine occurrence of Carpal tunnel syndrome in a population of pregnant women. The study included 301 women who delivered at term (between 37 and 41 weeks of pregnancy).An original questionnaire about CTS symptoms was prepared for the purpose of the study. A part of the research group underwent Phalen sign evaluation. 98 patients (32.6%) reported occurrence of at least one CTS symptom during pregnancy and 22 patients (22.4%) had similar symptoms in previous pregnancies. They concluded that CTS symptoms are quite common during pregnancy. Early detection of CTS symptoms in pregnant women is very important, because it allows introduction of conservative treatment, which is successful in most cases.

Carpal tunnel syndrome (CTS) occurring during pregnancy is considered to have a short and benign course and very few cases required surgery, however there is no information in literature on long term follow-up. Mondelli et al [56] conducted a study to report 3-year follow-up after delivery in a sample of pregnant women with CTS. 45 consecutive pregnant women with CTS (mean age 32 years) were enrolled. Diagnosis was based on clinical and electrophysiological

findings. Clinical and electrophysiological severity of CTS were scored according to an ordinal scale and the self-administered Boston questionnaires on symptoms and functional status of the hand during pregnancy and one-year after delivery. Improvement of symptoms was evident at 1 year and 3 year follow-up, but about half of the women still complained of symptoms 3 years after delivery.

CLINICAL FEATURES

A. SYMPTOMS-

Symptoms of carpal tunnel syndrome include numbness, tingling, and pain, primarily in the thumb, index, middle, and ring fingers. Pain or tingling can travel up the forearm toward the shoulder. There can also be weakness and clumsiness in the hand. This may make it difficult to perform fine movements such as buttoning shirt, combing hairs. Patients may also experience dropping things, due to weakness, numbness, or a loss of proprioception.

In most cases, the symptoms of carpal tunnel syndrome usually begin gradually. But as the condition worsens, symptoms may occur more frequently or may persist for longer periods of time. Night-time symptoms are a common occurrence. Many people have a tendency to sleep with bent wrists which can precipitate the symptoms at night. During the day, symptoms often occur when holding something for a prolonged period of time with the wrist bent forward or backward, such as when using a phone, driving, or reading a book.

B. SIGNS-

Clinical examination plays a pivotal role in diagnosis and management of carpal tunnel syndrome. Diagnostic efficacy of clinical examination is as good as Nerve conduction studies. Three provocative tests are commonly employed for clinical evaluation of carpal tunnel syndrome. The basic mechanism of the pressure provocative tests works on ‘double crush hypothesis’ which states that a compromised nerve already has a lower threshold to mechanical pressure as compared to an uncompromised nerve, so any additional pressure will cause

symptoms of nerve compression readily when compared to the response of additional pressure on a normal nerve.

1.Phalen test- Phalen test works on the principle that Flexion of the wrist causes compression of the nerve between the transverse carpal ligament (TCL) and flexor tendons in the carpal tunnel, causing paraesthesia in the median nerve distribution reproducing the patient's symptoms. It is performed by having the patient hold the forearm vertically with the elbows resting on the table and then allowing both hands to drop with complete wrist flexion for approximately one minute. The test is considered positive when paraesthesia develops within one minute. Patients with advanced CTS often note paraesthesia in less than 20 seconds. Kuschner et al(57) conducted a meta-analysis in 1992 in which they analysed the historical data of carpal tunnel syndrome patients and compared their Phalen's test results with that of 100 individuals without carpal tunnel syndrome (200 wrists). They concluded that the Phalen's test has a greater sensitivity and specificity, and can be of use in evaluation of carpal tunnel syndrome. Seror et al [58] studied Phalen test in 127 patients with carpal tunnel syndrome and 20 control subjects, all of whom also had nerve conduction studies. There was a statistically significant relationship between the severity of electrical changes and the probability of a positive Phalen's test. However 34% of patients had a negative test and 20% of control subjects a positive one indicating that Phalen test is useful in diagnosis of Carpal tunnel syndrome to a limited extent. Sawaya et al [59] conducted a study in which they performed nerve conduction studies on 54 hands in patients referred with the clinical diagnosis of carpal tunnel syndrome. They studied the motor and sensory latencies of the median and ulnar nerves and compared them with each other. They then divided the results into hands with no, mild, moderate, or severe carpal tunnel syndrome. Finally, they correlated these results with the presence or absence of the phalen's sign and concluded that the phalen's sign is present mostly in the moderate to severe median nerve entrapment, but still can sometimes be present as a false positive in normal hands.

2. Tinel sign- In tinel sign testing, examiner taps lightly over the site of the median nerve at the distal wrist crease of the patient's forearm. Occurrence of tingling or discomfort in the fingers supplied by the median nerve denotes a positive sign. However, tinel sign has a limited value in clinical workup of carpal tunnel syndrome.

Sensitivity of these tests, as given in the literature, ranges from 42 to 85% (Phalen test) and from 38 to 100% (Tinel sign), and specificity from 54 to 98% and from 55 to 100% respectively.

Bruske et al[60] conducted a study in 2002 to assess the usefulness of the phalen test and tinel sign in the diagnosis of carpal tunnel syndrome. The clinical group consisted of 112 patients (147 hands) with CTS confirmed clinically and on nerve conduction studies. The control group of 50 patients (100 hands) was selected from hospital volunteers, who did not complain of any hand symptoms. Sensitivity and specificity of the phalen test turned out to be respectively 85% and 89% and for the tinel test, 67% and 68%. These findings indicated essential diagnostic value for the phalen test, but considerably smaller for the tinel sign.

LaJoie et al [61] conducted a study to determine the sensitivity and specificity of common diagnostic tests for carpal tunnel syndrome. Latent class analysis was used to determine the accuracy rates of commonly used measures of carpal tunnel syndrome- tinel's sign, phalen's test. Data included 162 wrists from 81 patients seeking treatment for symptoms associated with carpal tunnel syndrome. Tinel's sign and phalen's test were both highly sensitive (0.97 and 0.92, respectively) and specific (0.91 and 0.88, respectively). They concluded that estimates of the sensitivity and specificity of these common tests for carpal tunnel syndrome support their widespread clinical use.

3. Durkan test (Carpal compression test)- This test is a recent advancement in clinical analysis of CTS. In this test, examiner presses his thumb over the carpal tunnel area of the patient and holds the pressure for 30 seconds. Onset of pain or paraesthesia in the median nerve distribution in less than 30 seconds is positive durkan sign. In

studies of diagnostic accuracy, the sensitivity of durkan's test ranged from 87% to 91% and its specificity from 90% to 95%.

Durkan et al [62] conducted a study in 1991 to compare the efficacy of durkan test with phalen test and tinel sign. The results of the tinel percussion test, the phalen test, and the new test were evaluated in 31 patients (46 hands) in whom the presence of carpal tunnel syndrome had been proved via nerve conduction study, as well as in a control group of 50 subjects. They concluded that for the diagnosis of carpal tunnel syndrome, the carpal compression test was found to be more sensitive and specific than the Tinel and Phalen tests.

INVESTIGATIONS-

The diagnosis of carpal tunnel syndrome is primarily made on basis of history and physical examination findings. However, adjunctive tests are useful when the diagnosis is in doubt. Electrodiagnostic testing (nerve conduction studies) are primarily used for diagnosis of CTS. Radiological investigations including ultrasound, magnetic resonance imaging, and computed tomography can also be useful.

Nerve conduction studies and electromyography are Gold standard for diagnosis of carpal tunnel syndrome. Nerve conduction studies and electromyography are also used to quantify and stratify disease severity, which may help in treatment decisions. Across various literature, Nerve conduction studies are documented to have a sensitivity of 56-85% and a specificity of at least 94% for carpal tunnel syndrome. Nerve conduction studies are often paired with Electromyography in order to differentiate muscular causes of weakness from neurological causes.

However, Nerve conduction studies have certain limitations. A small percentage of asymptomatic patients can have positive test. Similarly, a small percentage of individuals can have negative nerve conduction study despite having symptoms of CTS.

TREATMENT-

Management of carpal tunnel syndrome is based on severity. Patients with mild disease are managed conservatively with medicines including NSAIDs and other analgesics and supportive care including physiotherapy and splints like Cock-up and neutral wrist splints. Patients not improving with the same are started on oral corticosteroids. Local corticosteroid injections can also be used for refractory symptoms. Patients with moderate to severe disease, or those with persistent symptoms despite conservative treatment, are managed with surgical interventions.

CONSERVATIVE MANAGEMENT

Lifestyle Modification. Avoiding repetitive motions, using ergonomic equipment (e.g., wrist rest, mouse pad), taking breaks, using keyboard alternatives (e.g., digital pen, voice recognition and dictation software), and alternating job functions have been implicated for management of carpal tunnel syndrome.

Oral Medication. NSAIDs like naproxen, ibuprofen, indomethacin etc are used for symptomatic relief from pain in mild to moderate cases. Diuretics are useful in conditions which cause fluid retention and oedema ultimately causing carpal tunnel syndrome. Oral corticosteroids produce significant short-term symptom relief, however their effect weans off over longer periods of time resulting in recurrence of symptoms.

Splinting. Use of neutral and cock-up wrist splints have been associated with good outcomes. There is good evidence supporting the use of splints 24 hours a day (full-time) over night-only use. The average time period for using splints is variable with most clinicians advising use of splints for 6-8 weeks.

Corticosteroid Injection. Local corticosteroid injections can be used as an initial treatment or as an adjunctive therapy to other supportive treatment. Local and systemic corticosteroids yield significant resolution of symptoms in patients with mild carpal tunnel syndrome for up to one month after the injection, with many patients reporting relief

for up to one year. Corticosteroid injection are particularly useful for patients wanting to delay surgical treatment.

The procedure involves placing a small bolus of corticosteroid beneath the flexor retinaculum and within the carpal tunnel. Traditionally, 20 mg of triamcinolone acetonide (Kenalog) without lidocaine (Xylocaine) is injected using a 1-mL syringe with a 25-gauge, 1.25-inch needle. Median nerve injury is a major potential complication of these injections.

SURGICAL TREATMENT

Patients who do not improve after conservative treatment or patients who fall in the category of severe disease are considered for surgery. Surgical release of the transverse ligament provides high initial success rates (more than 90%), with low rates of complication. The surgical procedure performed is called a “carpal tunnel release”. It can be an open carpal tunnel release or endoscopic carpal tunnel release. In most cases, carpal tunnel surgery is done on an outpatient basis. The surgery can be done under general anaesthesia or under local anaesthesia.

Despite all the treatment options, controlling weight and BMI, cessation of smoking, change of occupational habits, and adequate management of systemic diseases including diabetes, hypothyroidism and rheumatoid arthritis are the mainstay treatment in managing carpal tunnel syndrome.

MATERIAL AND METHODS

This was a prospective observational study conducted on patients diagnosed with carpal tunnel syndrome diagnosed on nerve conduction studies in Dayanand Medical College and Hospital, Ludhiana. This study was conducted between January 2019 to December 2019.

Selection criteria-

Inclusion criteria-

1. All patients aged more than 18 years (males and females) were included.
2. All patients who were diagnosed with carpal tunnel syndrome on nerve conduction studies.

Exclusion criteria-

1. Patients aged <18 years of age.
2. Patients who had carpal tunnel syndrome symptoms but had normal nerve conduction studies.

During the study period, all subjects were selected on basis of Nerve conduction velocity(NCV) studies diagnosed CTS and completed a history, clinical symptom questionnaire including age, gender, height, weight, pain, tingling, numbness, aggravating factors, relieving factors, lifestyle. All subjects were clinically examined for presence of tenderness, paraesthesia, phalen test, tinel sign and durken test. All subjects were further evaluated for associated risk factors like obesity, diabetes, hypothyroidism, routine activities and occupations involving excess use of hands. Subjects were categorised into mild grade and moderate to severe grade on NCV studies. Grade 1 to 2 was classified as mild CTS whereas grade 3 to 5 was classified as moderate to severe CTS.

Statistical Analysis-

All the collected data was entered into SPSS (statistical package for social science) SPSS 21 version statistical program for Microsoft Windows. Data was expressed as range, mean ± standard deviation, frequencies (number of cases) and relative frequencies(percentages) as appropriate. For comparing categorical data, Chi square test was

performed and exact test was used when expected frequency was less than 5. A probability value (p value) less than 0.05 was considered statistically significant.

OBSERVATION AND RESULTS

A total of consenting 200 patients having CTS on NCV study were enrolled in this study. A questionnaire regarding history, examination, demographics and NCV findings of the patients was prepared and completed for all the patients.

CLINICAL CHARACTERSTICS

AGE DISTRIBUTION -

TABLE 1- AGE WISE DISTRIBUTION OF PATIENTS WITH CTS

Most patients(64) in our study were in the age group between 51-60 years (32%). The mean age of presentation was 49.73 ± 10.9 years in our cohort.

Age	No. of cases	Percentage
< 30	5	2.5%
31-40	45	22.5%
41-50	52	26.0%
51-60	64	32.0%
61-70	31	15.5%
> 70	3	1.5%
Total	200	100.0%

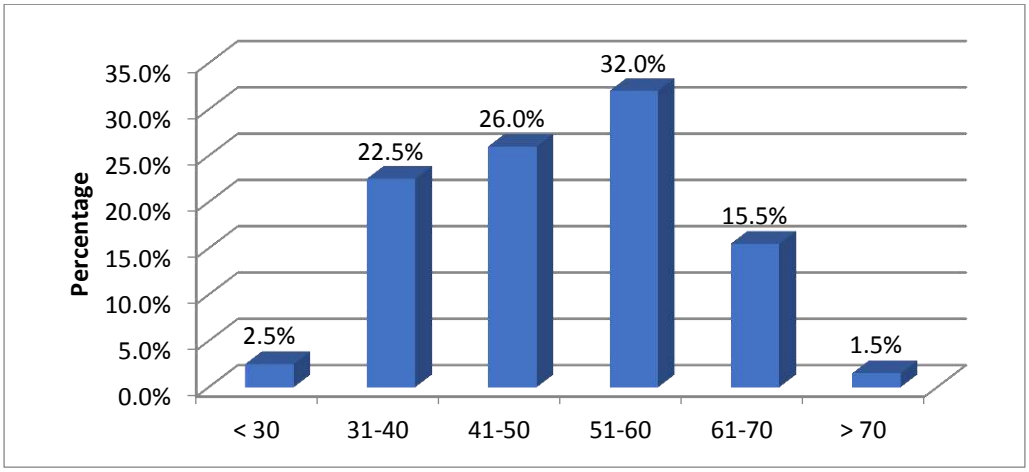

FIG.1: AGE WISE DISTRIBUTION OF PATIENTS WITH CTS

SEX DISTRIBUTION -

TABLE 2- SEX WISE DISTRIBUTION OF PATIENTS WITH CTS

GENDER(M/F)	No. of cases	Percentage
F	149	74.5%
M	51	25.5%
Total	200	100.0%

In our study, there were 149 females(74.5%) and 51 males(25.5%) out of 200 patients.

The female: male ratio in our study was 2.9 suggesting CTS is a disease predominantly seen in female population.

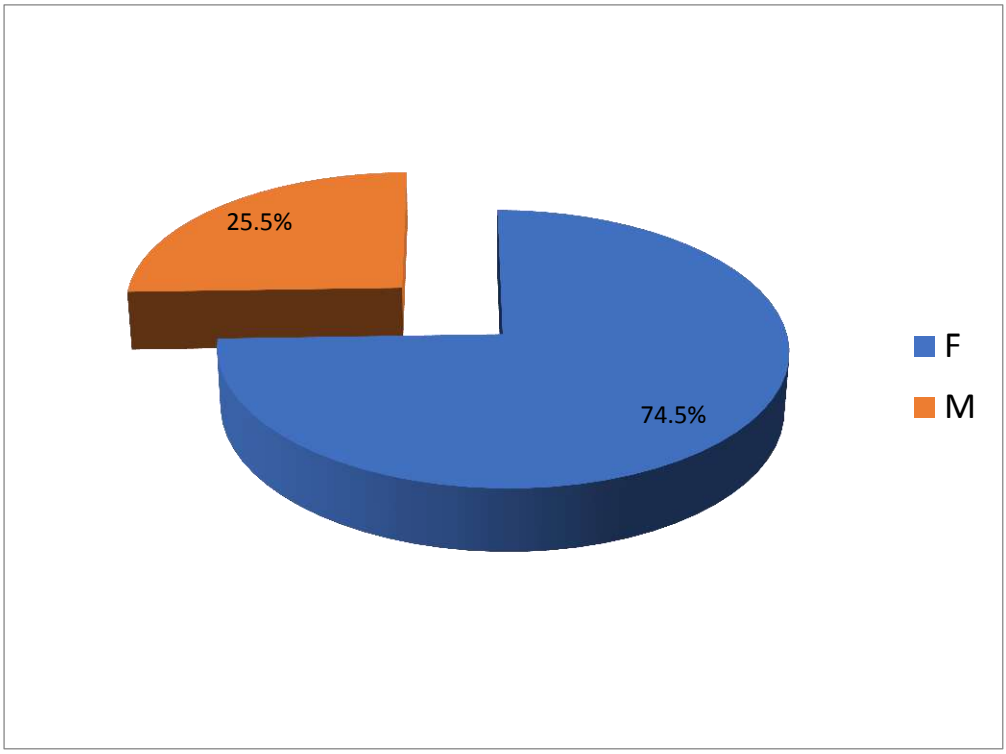

FIG.2- SEX WISE DISTRIBUTION OF PATIENTS WITH CTS

TABLE 3- GENDER DIFFERENCES REGARDING SEVERITY OF CTS

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
GENDER (M/F)	F	99	38.5%	158	61.5%	257	0.35	0.554
	M	35	42.2%	48	57.8%	83		

Out of 83 wrists of the male participants, 35(42.2%) wrists had mild CTS and 48(57.8%) had moderate to severe CTS. On the other hand, of the 257 wrists of female participants, 99(38.5%) wrists had mild CTS whereas 158(61.5%) wrists had moderate to severe CTS(p value-0.554). There was no statistically significant association between severity of CTS and gender difference.

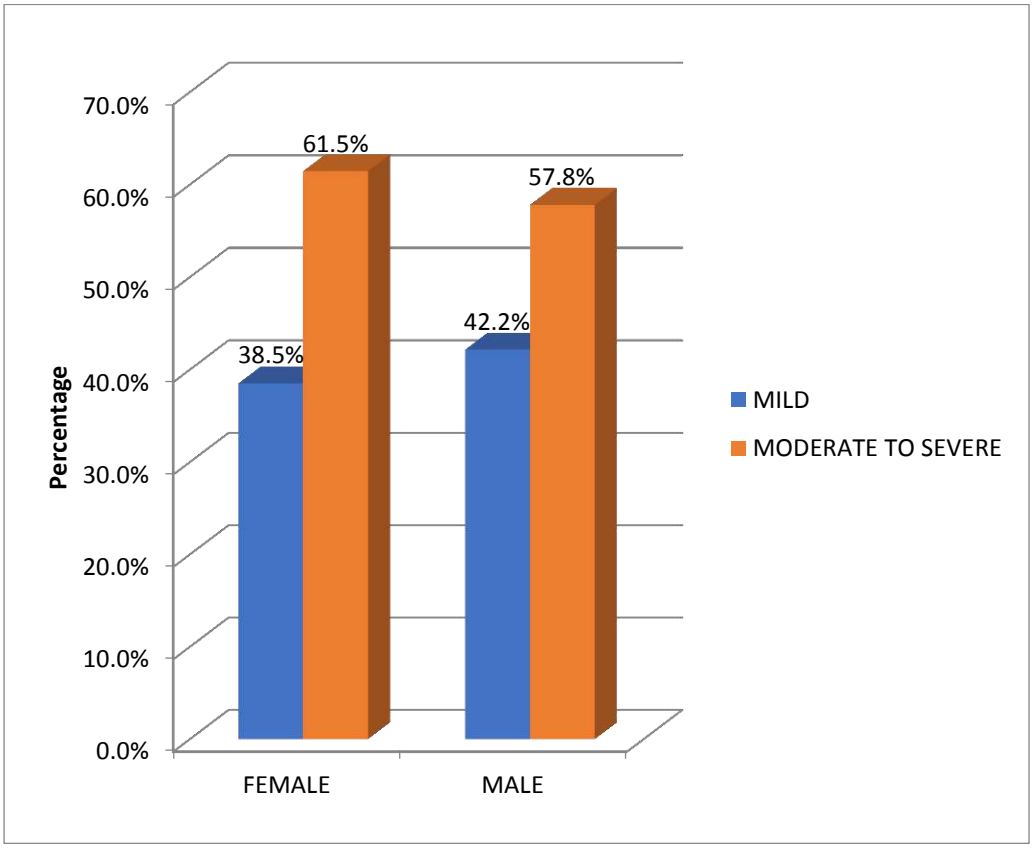

FIG.3- GENDER DIFFERENCES REGARDING SEVERITY OF CTS

BMI DISTRIBUTION -

TABLE 4- BMI PATTERN OF PATIENTS WITH CTS

BMI(KG/M2)	No. of cases	Percentage
< 24.9	28	14.0%
25-29.9	106	53.0%
> 30	66	33.0%

In our study, out of 200 cases, 106(53%) cases were overweight (BMI 25-29.9 kg/m2) followed by 66(33%) who were obese(BMI>30kg/m2) while 28(14%) cases were having normal BMI <25kg/m2.

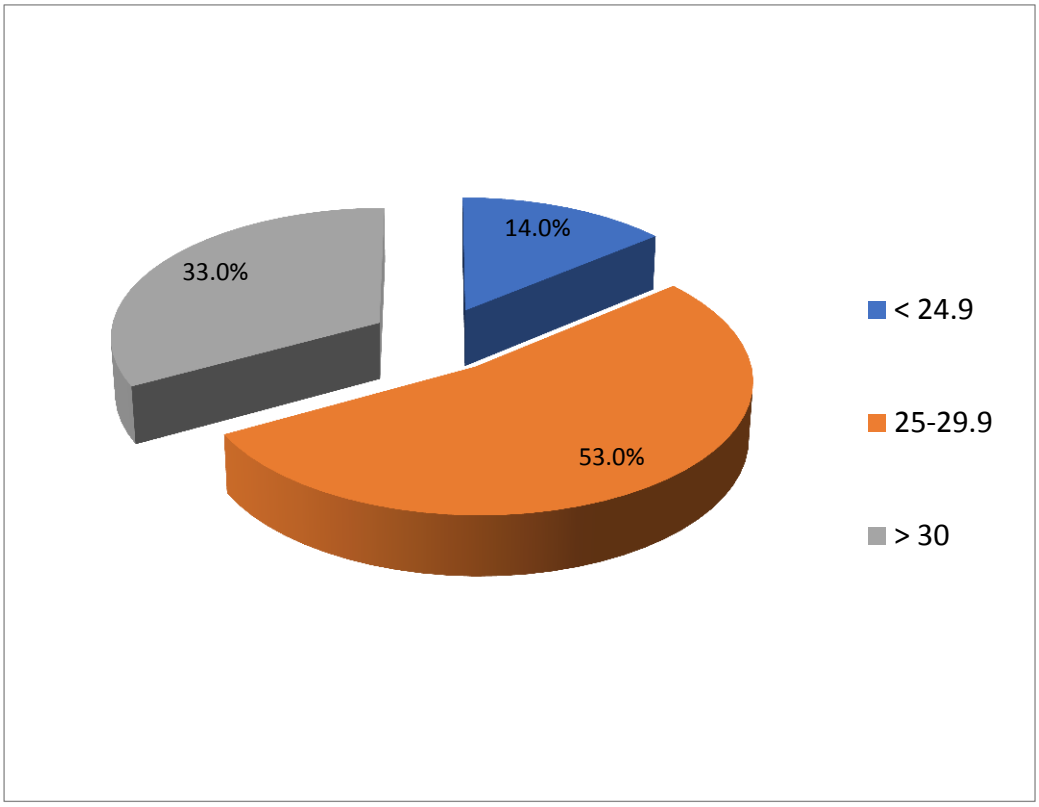

FIG.4- BMI PATTERN OF PATIENTS WITH CTS

Table 5- SEVERITY VARIATION WITH BMI IN PATIENTS WITH CTS

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
BMI group	< 25	14	35.0%	26	65.0%	40	3.593	0.166
	25-30	81	44.0%	103	56.0%	184		
	> 30	39	33.6%	77	66.4%	116		

In our study, in candidates falling in overweight category (BMI 25-30), 81(44%) wrists had mild CTS while 103(56%) wrists had moderate to severe CTS. In obese group (BMI>30), 39(33.6%) wrists had mild CTS whereas 77(66.4%) had moderate CTS. There was no statistically significant difference of severity of CTS in correlation with the BMI value.

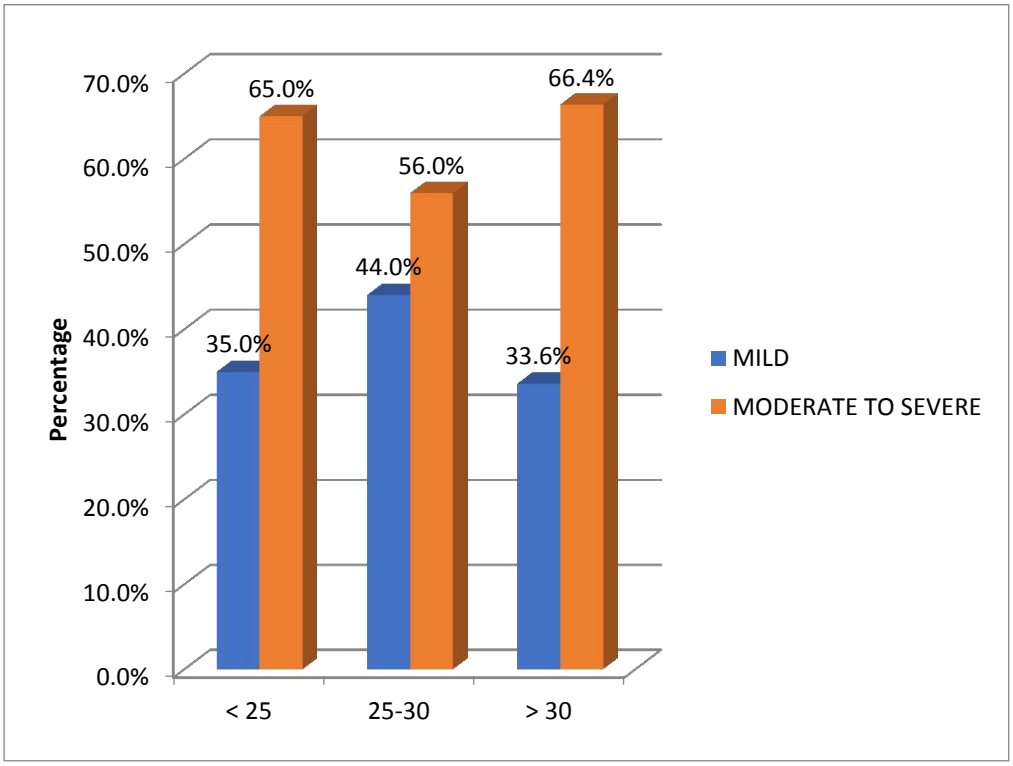

FIG.5- SEVERITY VARIATION WITH BMI IN PATIENTS WITH CTS

OCCUPATION -

TABLE 6- OCCUPATION IN PATIENTS WITH CTS

OCCUPATION	No. of cases	Percentage
Non skilled workers	115	57.5%
Skilled workers requiring mild use of hands	64	32.0%
Skilled workers requiring significant use of hands	21	10.5%

Based on the occupation, all the participants in the study were divided into 2 categories- non skilled workers (Housewives, retired persons and students) and skilled workers. Skilled Workers group was further subdivided into occupations requiring significant use of hands(agriculture workers, farmers, carpenters, drivers, labourers, milkmen) and occupations requiring mild use of hands(service sector, shopkeepers, businessmen and self-employed persons).

In our study, the non-skilled workers group constituted the major bulk with 115 (57.5%) patients belonging to this category. 85 (42.5%) belonged to the skilled workers category. Of these 85, 64 (32%) cases belonged to skilled workers requiring mild use of hands and 21 (10.5%) cases belonged to skilled workers requiring significant use of hands.

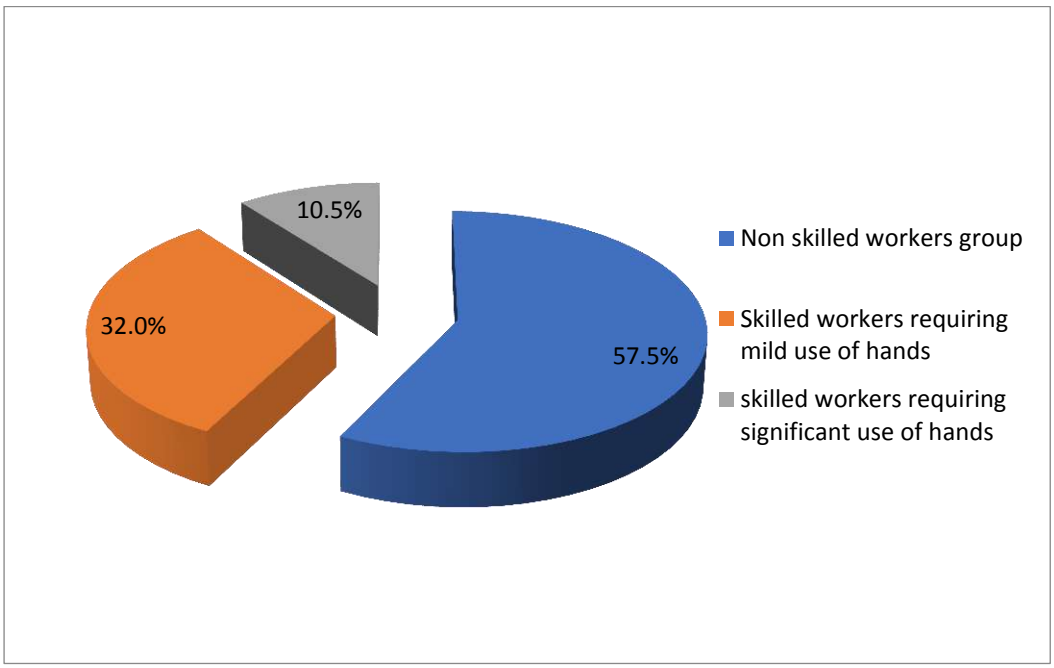

FIG.6- OCCUPATION IN PATIENTS WITH CTS

CATEGORISING THE MODIFIABLE RISK FACTORS

DRIVING -

TABLE 7- NUMBER OF CTS PATIENTS INVOLVED IN DRIVING A VEHICLE

DRIVING	No. of cases	Percentage
NO	122	61.0%
YES	78	39.0%
Total	200	100.0%

In our study, 78 participants out of 200 (39%) had a history of driving a vehicle (2 wheeler/ 4 wheeler).

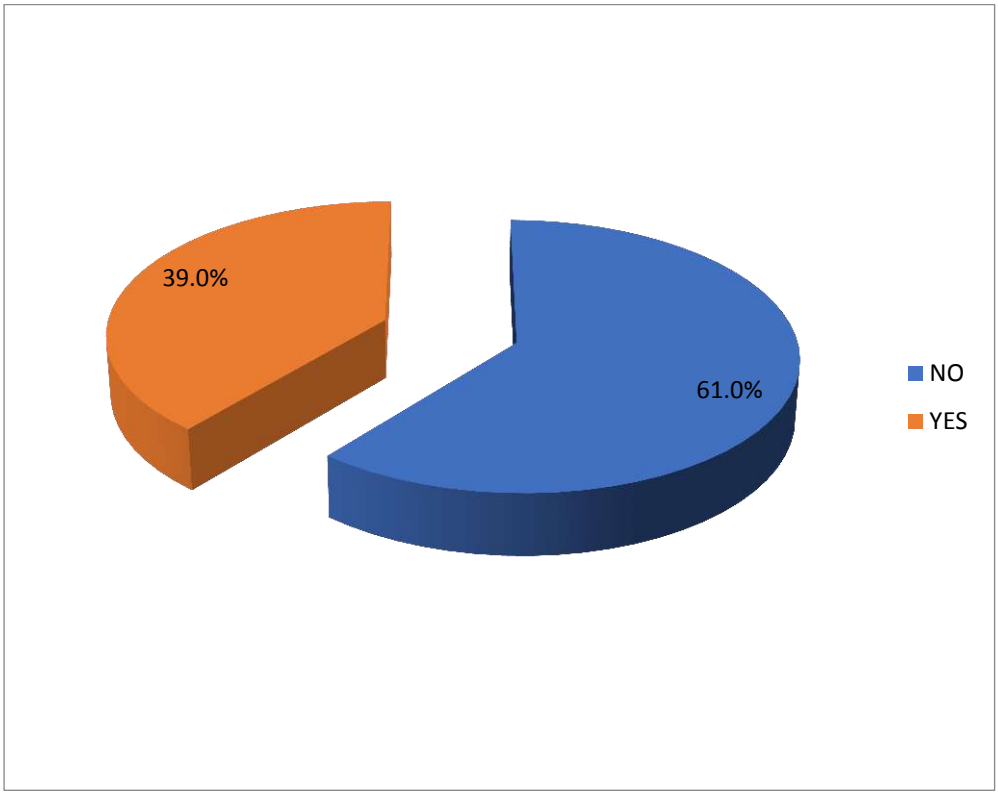

FIG.7- NUMBER OF CTS PATIENTS INVOLVED IN DRIVING A VEHICLE

TABLE 8- DURATION OF DRIVING IN YEARS

DURATION(YEARS)	No. of cases	Percentage
≤ 5	8	10.3%
5-10.0	30	38.5%
10-15.0	13	16.7%
15-20.0	17	21.8%
>20	10	12.8%

38.5% had been driving a vehicle for 5-10 years. 51.28% of the participants had a history of driving a vehicle for more than 10 years. The mean duration of driving was 14.5 ± 17.4 years.

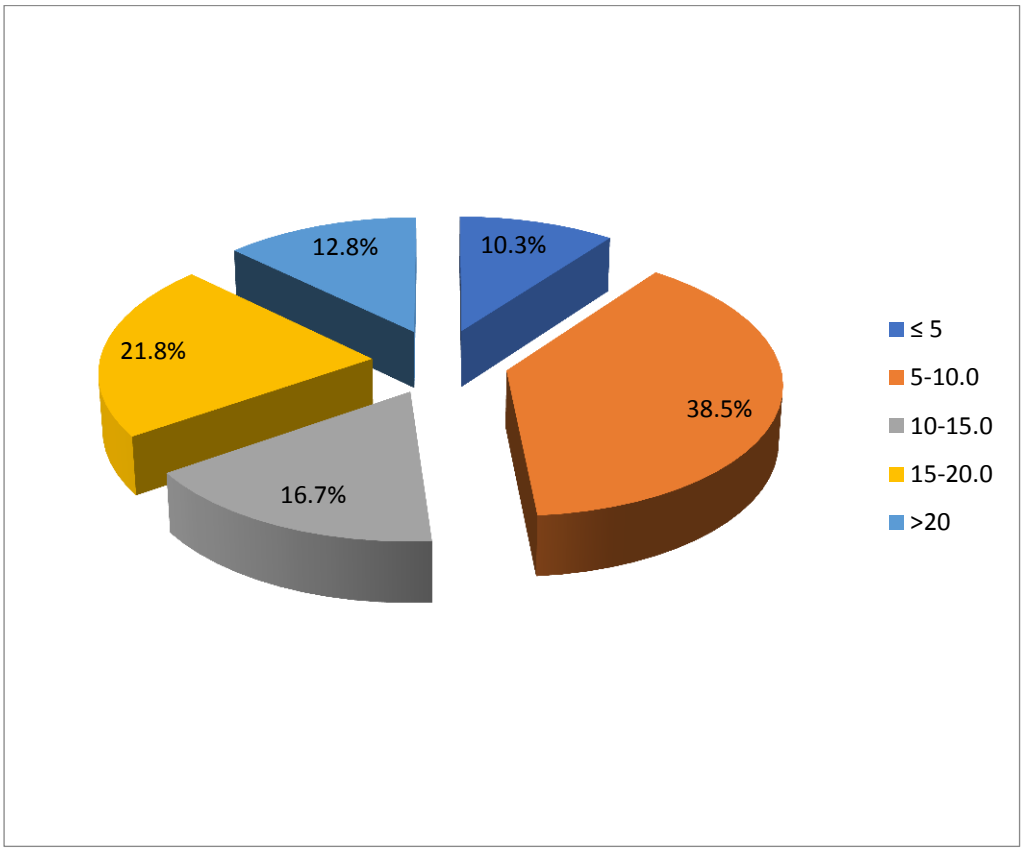

FIG.8- DURATION OF DRIVING IN YEARS

TABLE 9- HOURS OF DRIVING PER DAY

HOUR(S)/DAY	No. of cases	Percentage
≤1	50	64.1%
1-2.0	22	28.2%
> 2	6	7.7%
Total	78	100.0%

64.1% cases had been driving a vehicle daily for 1 hour. However, the mean duration of driving was 1.65 ± 1.6 hours/day.

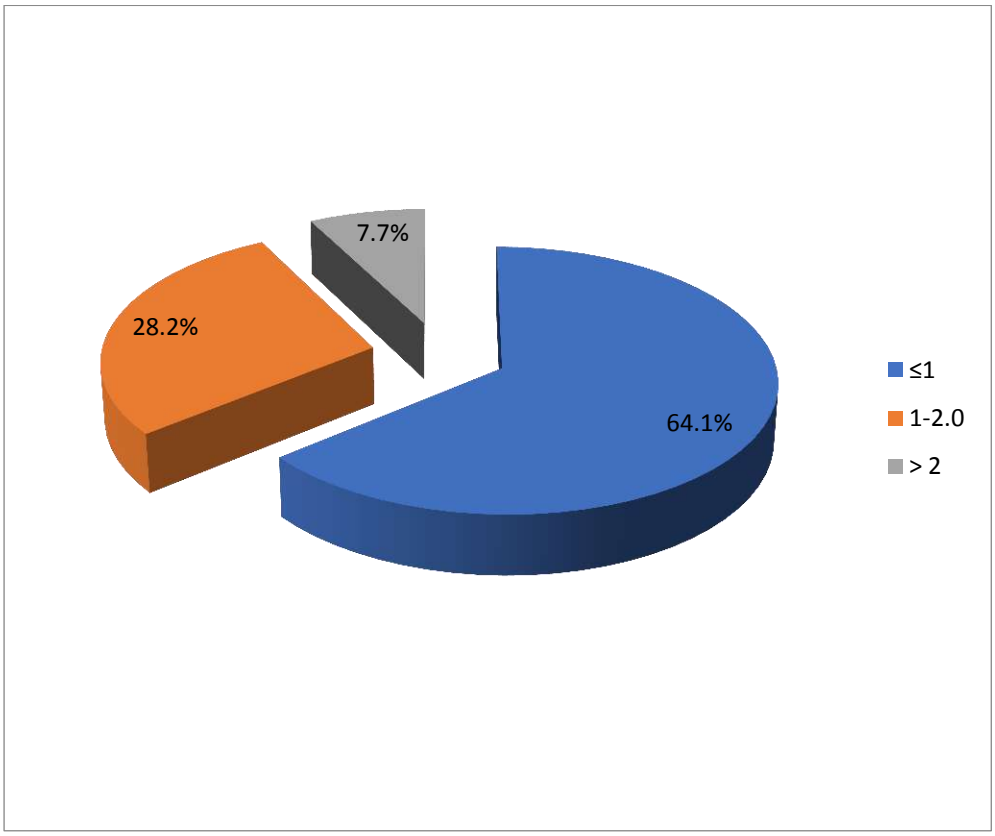

FIG.9- HOURS OF DRIVING PER DAY

TABLE 10- WORSENING OF SYMPTOMS ON DRIVING

SYMPTOMS INCREASED BY DRIVING	No. of cases	Percentage
NO	11	14.2%
YES	67	85.8%
Total	78	100.0%

67 (85.8%) of the 78 participants reported worsening of CTS symptoms on driving a vehicle.

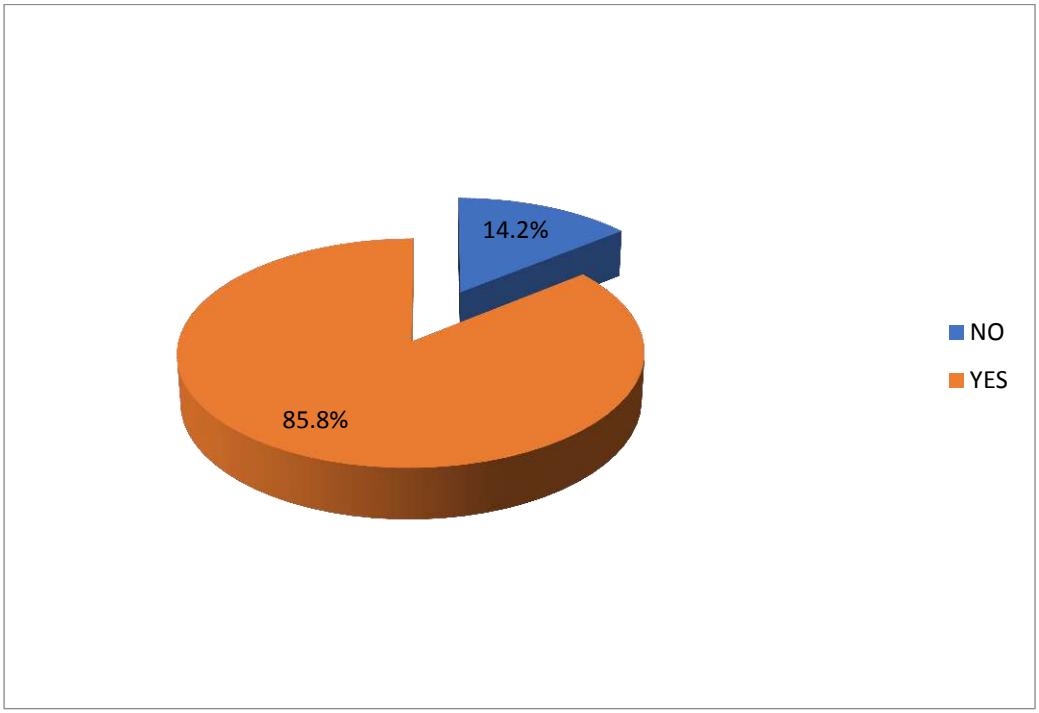

FIG.10- WORSENING OF SYMPTOMS ON DRIVING

WRITING -

TABLE 11- NUMBER OF CTS PATIENTS INVOLVED IN EXCESSIVE WRITING WORK

WRITING WORK	No. of cases	Percentage
NO	151	75.5%
YES	49	24.5%
Total	200	100.0%

24.5% (49 out of 200) cases were involved in excessive writing work.

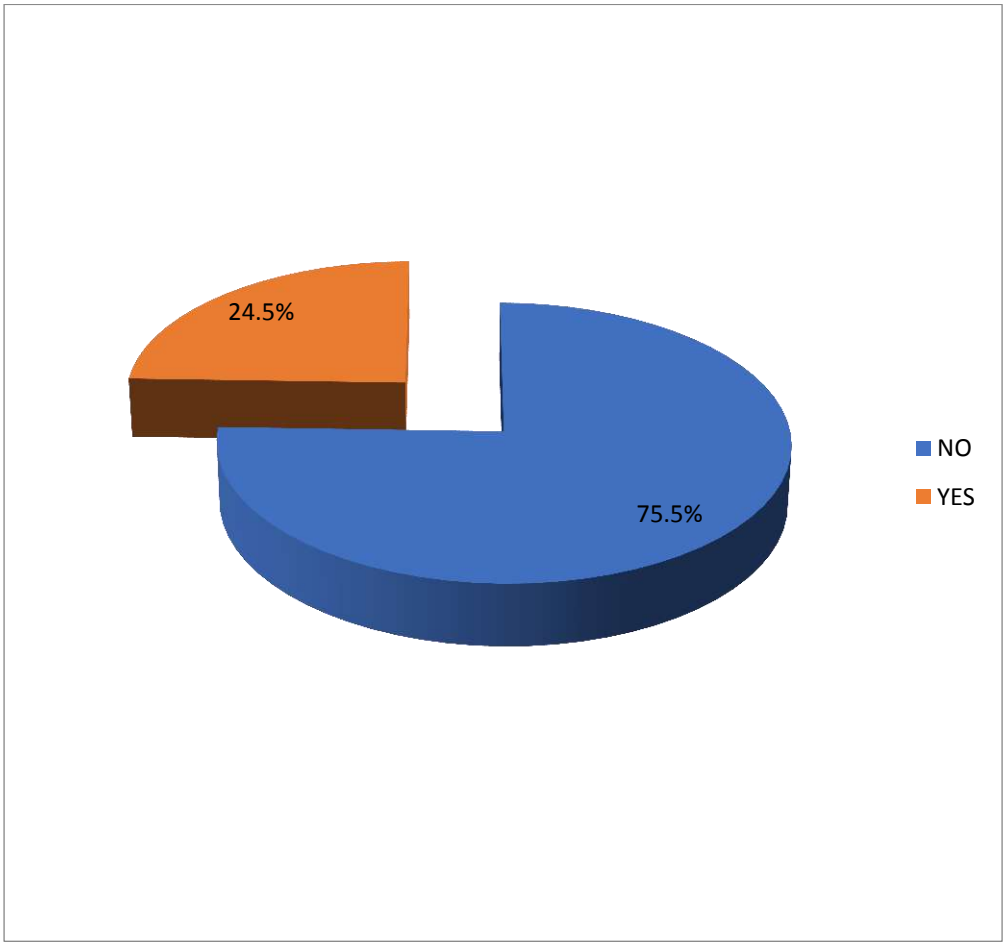

FIG.11- NUMBER OF CTS PATIENTS INVOLVED IN EXCESSIVE WRITING WORK

TABLE 12- DURATION OF WRITING WORK IN YEARS

DURATION(YEARS)	No. of cases	Percentage
≤ 10	13	26.5%
10-20.0	20	40.8%
20-30	14	28.6%
>30	2	4.1%
Total	49	100.0%

Out of these, 73.5% had been involved in such activity for more than 10 years. The mean duration of performing writing work in years was 18.5 ± 8.6 years

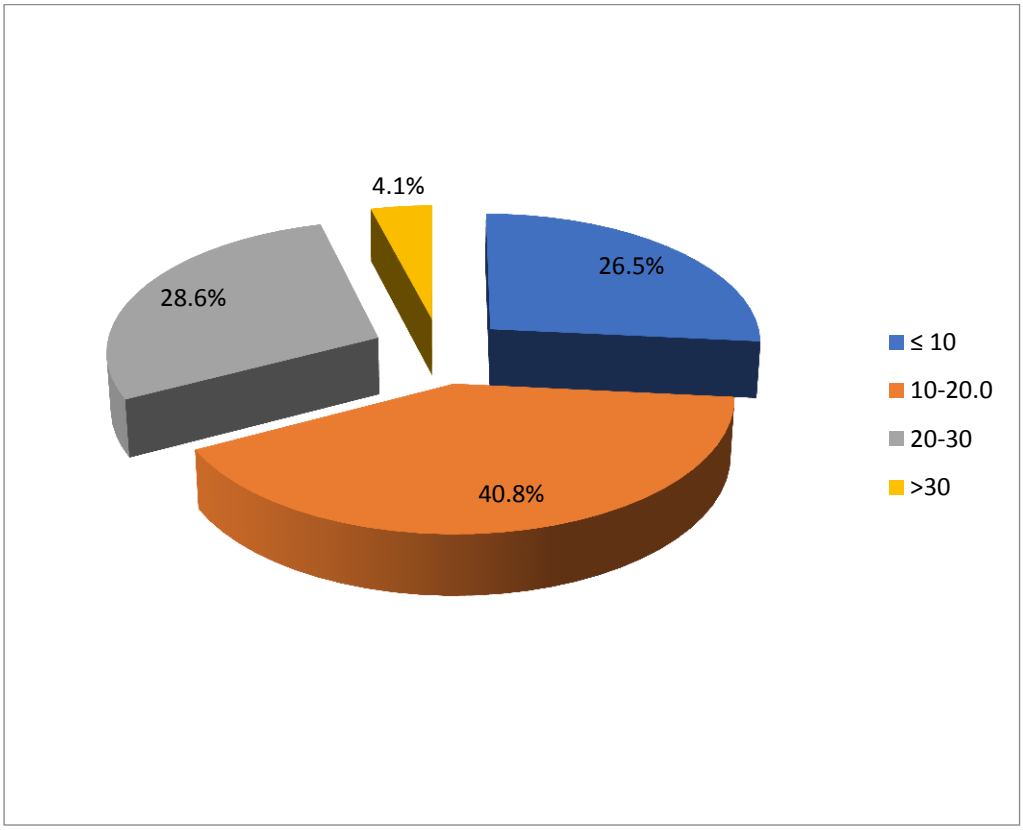

FIG.12- DURATION OF WRITING WORK IN YEARS

TABLE 13- HOURS OF WRITING WORK PER DAY

HOUR(S)/DAY	No. of cases	Percentage
≤ 2.0	10	20.4%
2-4.0	35	71.4%
> 4	4	8.2%
Total	49	100.0%

79.5% had a history of performing writing work for >2 hours a day. However, the mean duration of performing writing work in hours per day was 3.3 ± 1.1 hours/day.

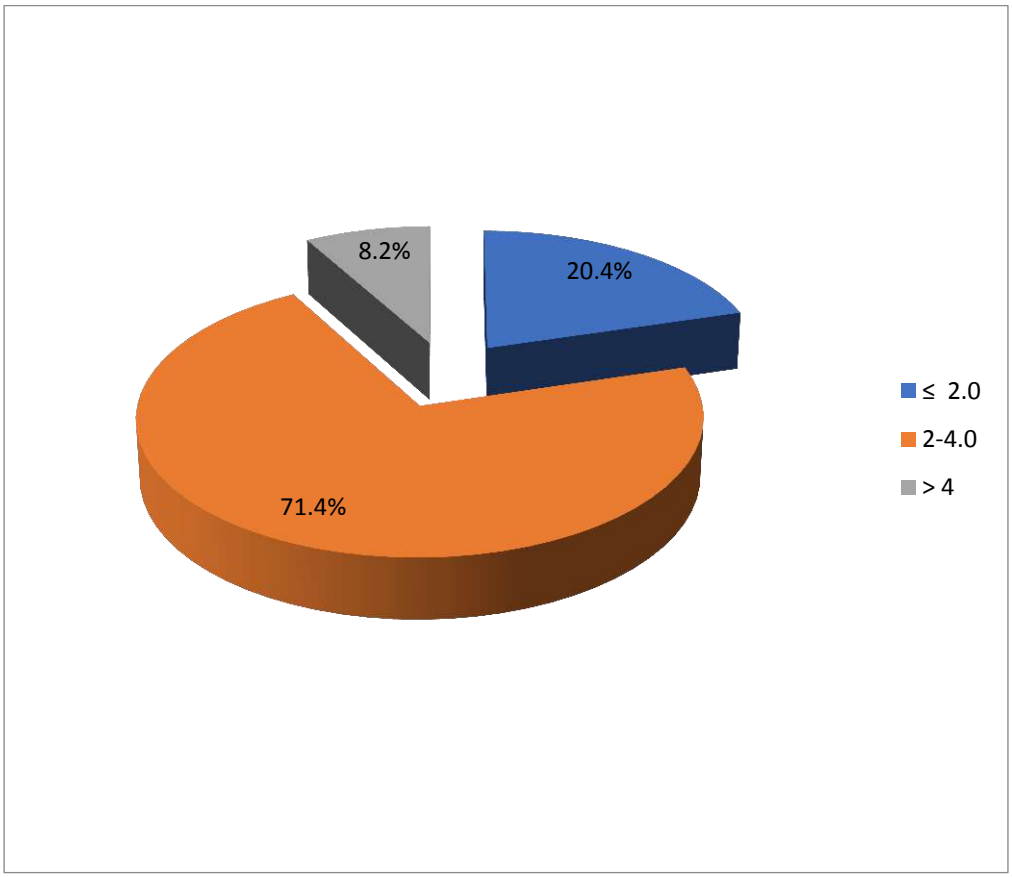

FIG.13- HOURS OF WRITING WORK PER DAY

TABLE 14- WORSENING OF SYMPTOMS ON PROLONGED WRITING WORK

SYMPTOMS INCREASED BY WRITING	No. of cases	Percentage
NO	5	10.2%
YES	44	89.8%
Total	49	100.0%

Of the 49 cases, 44(89.8%) reported worsening of CTS symptoms on performing writing work for long hours.

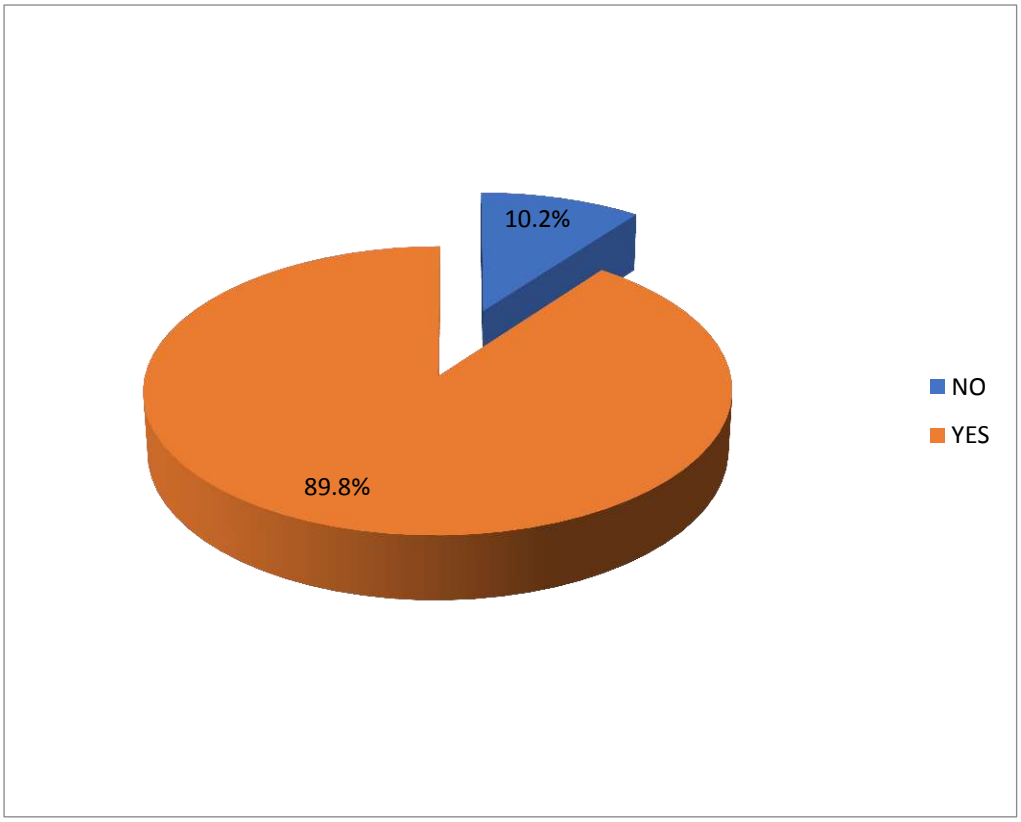

FIG.14- WORSENING OF SYMPTOMS ON PROLONGED WRITING WORK

COMPUTER USE -

TABLE 15- CTS PATIENTS WITH HISTORY OF PROLONGED COMPUTER USE

COMPUTER USE	No. of cases	Percentage
NO	165	82.5%
YES	35	17.5%
Total	200	100.0%

In our study, 35(17.5%) cases had a history of computer use in their profession.

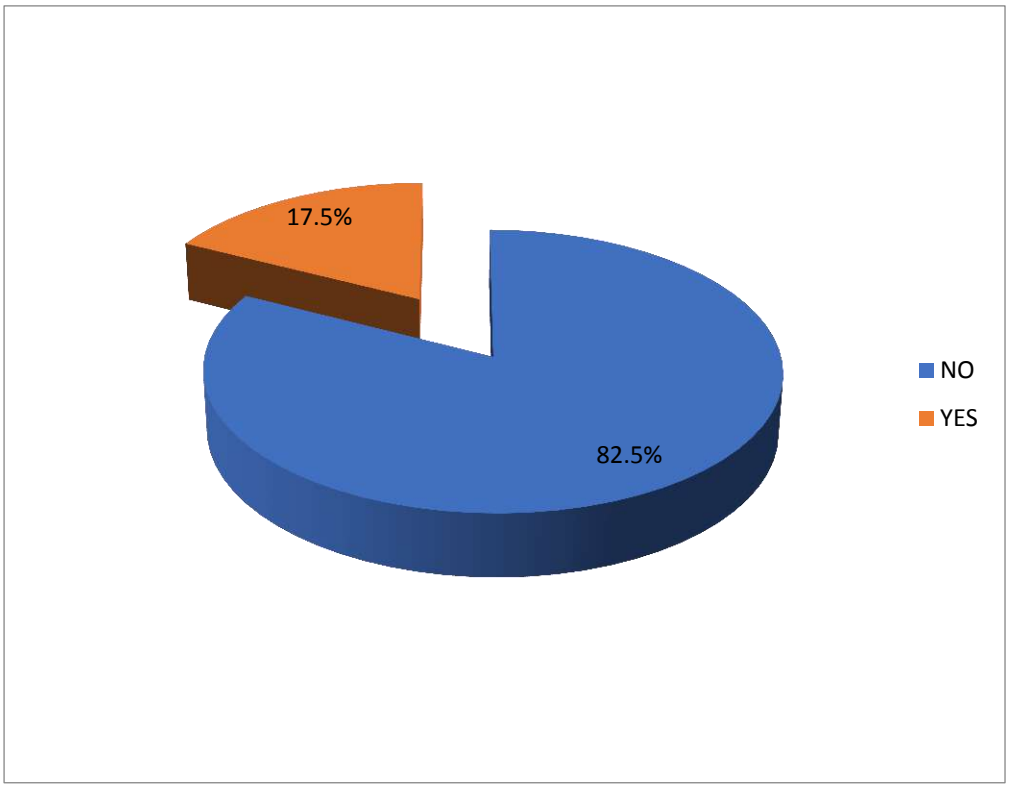

FIG.15- CTS PATIENTS WITH HISTORY OF PROLONGED COMPUTER USE

CTS PATIENTS WITH HISTORY OF PROLONGED COMPUTER USE

TABLE 16- YEARS OF COMPUTER USE IN CTS PATIENTS

DURATION(YEARS)	No. of cases	Percentage
≤ 5	8	22.9%
5-10.0	22	62.9%
> 10	5	14.3%
Total	35	100.0%

Out of these, 27(77.1%) had been using a computer for more than 5 years. The mean years of computer use was found to be 9.1 ± 3.5 years.

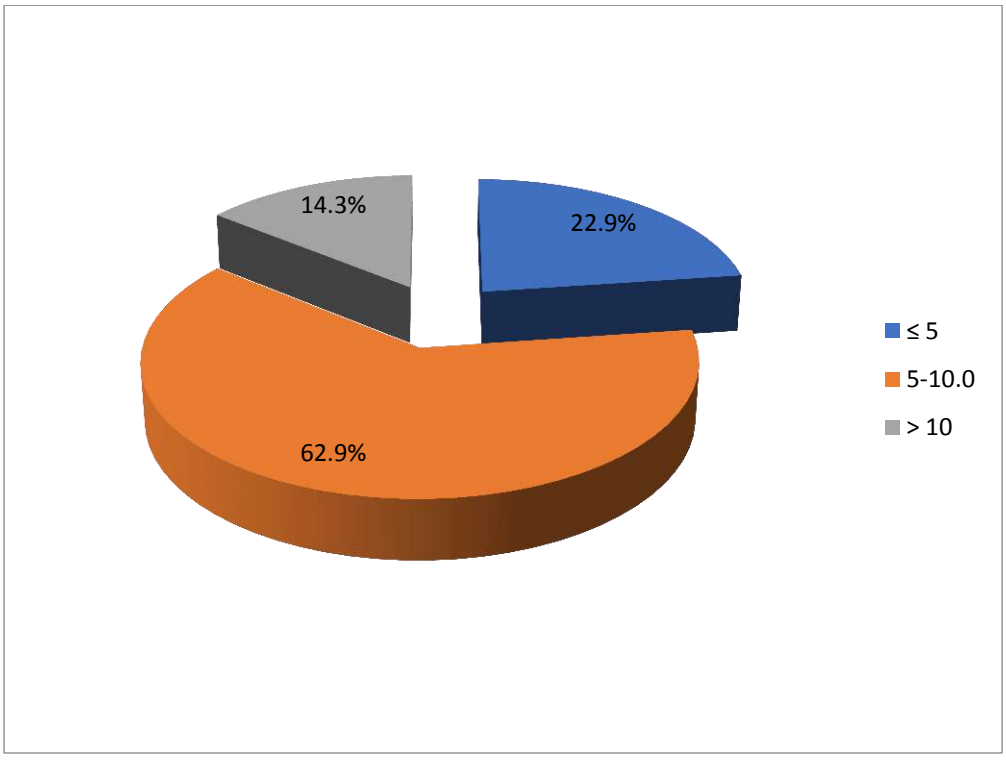

FIG.16-YEARS OF COMPUTER USE IN CTS PATIENTS

TABLE 17- HOURS OF COMPUTER USE PER DAY

HOUR(S)/DAY	No. of cases	Percentage
1.0-2.0	18	51.4%
2.0-3.0	13	37.1%
3.1-4.0	4	11.4%
Total	35	100.0%

Most cases (18) had been using a computer for 1-2 hours a day (51.4%). The mean hours of computer use was 2.43 ± 0.97 hours/day.

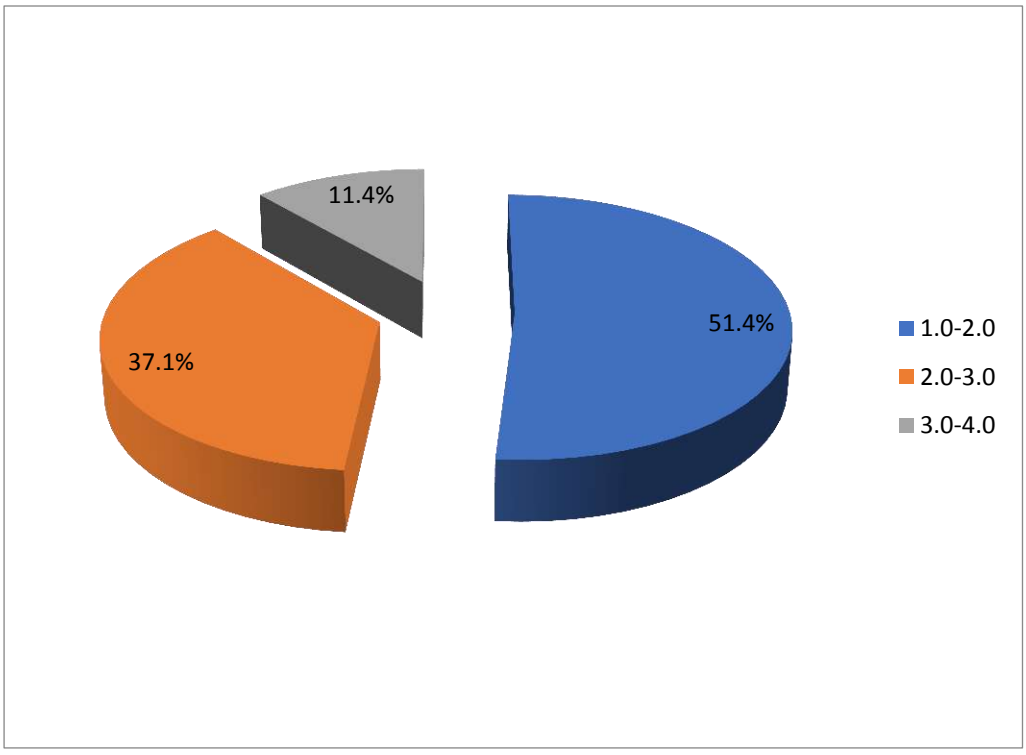

FIG.17- HOURS OF COMPUTER USE PER DAY

TABLE 18- WORSENING OF SYMPTOMS ON PROLONGED COMPUTER USE

SYMPTOMS INCREASED BY COMPUTER USE	No. of cases	Percentage
NO	4	11.5%
YES	31	88.5%
Total	35	100.0%

Of the 35 cases, 31(88.5%) reported worsening of CTS symptoms on using computer for long hours.

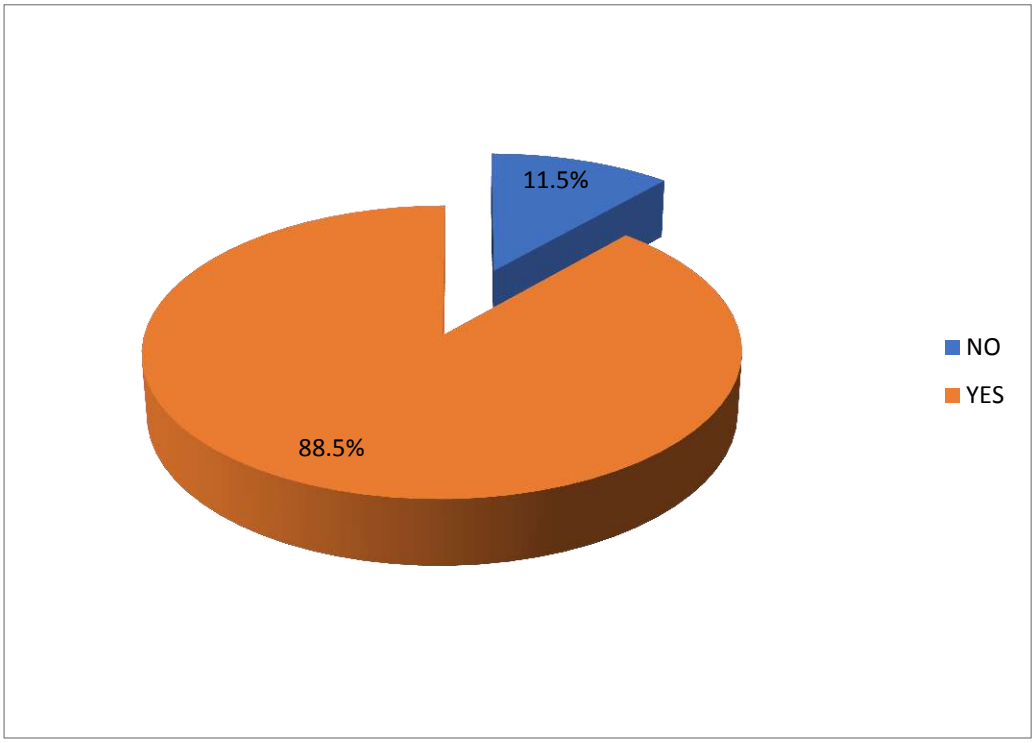

FIG.18- WORSENING OF SYMPTOMS ON PROLONGED COMPUTER USE

MANUAL COW MILKING -

TABLE 19- NUMBER OF CTS PATIENTS INVOLVED IN COW MILKING

COW MILKING	No. of cases	Percentage
NO	135	67.5%
YES	65	32.5%
Total	200	100.0%

In our study, out of 200 patients, 65 patients (32.5%) had a history of doing manual cow milking.

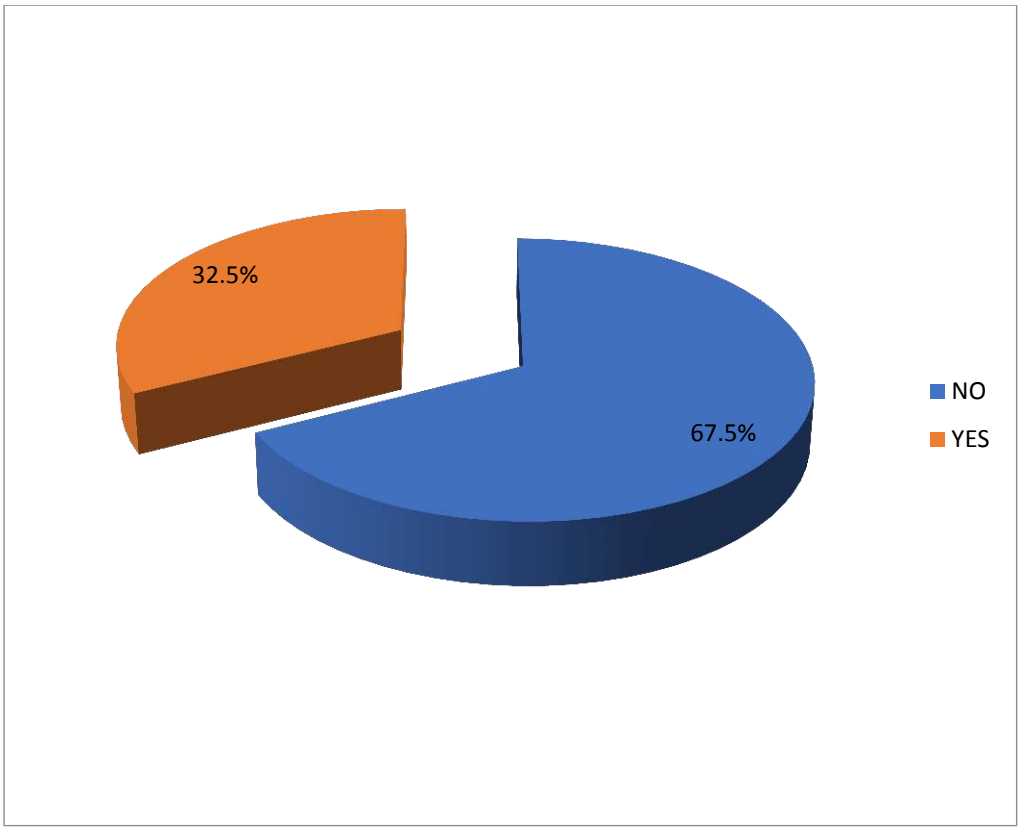

FIG.19- NUMBER OF CTS PATIENTS INVOLVED IN COW MILKING

TABLE 20- YEARS OF COW MILKING IN CTS PATIENTS

DURATION(YEARS)	No. of cases	Percentage
≤10	21	32.3%
10-20.0	27	41.5%
20-30	14	21.5%
30-40	3	4.6%
Total	65	100.0%

The mean duration of cow milking was 17.32 ± 9.0 years.

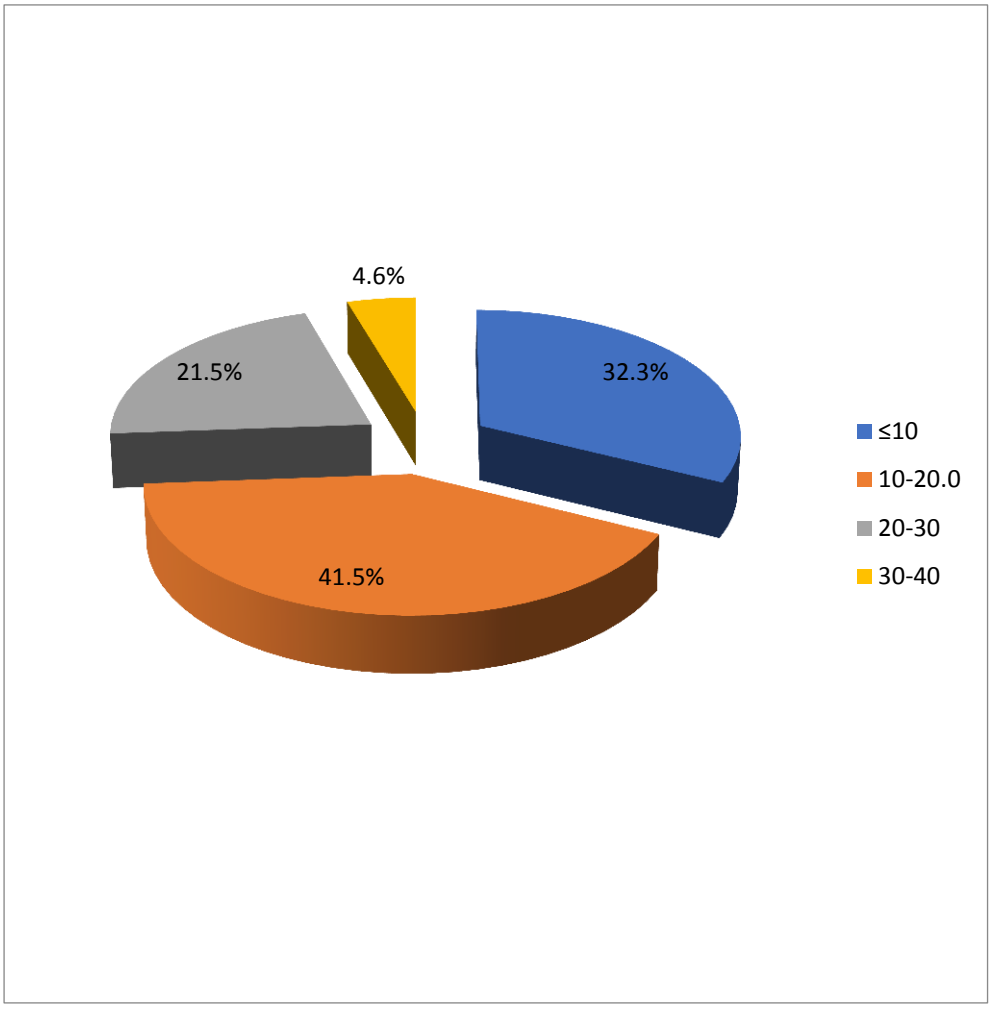

FIG.20- YEARS OF COW MILKING IN CTS PATIENTS

TABLE 21- HOURS OF COW MILKING PER DAY

TIME(HOUR(S)/DAY)	No. of cases	Percentage
≤ 1	16	24.6%
1.0-2.0	33	50.8%
2-3.0	16	24.6%
Total	65	100.0%

Of the 65, 49 (75.4%) cases had been doing cow milking for <2 hours a day and 16 (24.6%) cases had been doing cow milking for more than 2 hours a day. The mean duration of daily hours of cow milking was 2.4 ± 0.9 hours/day.

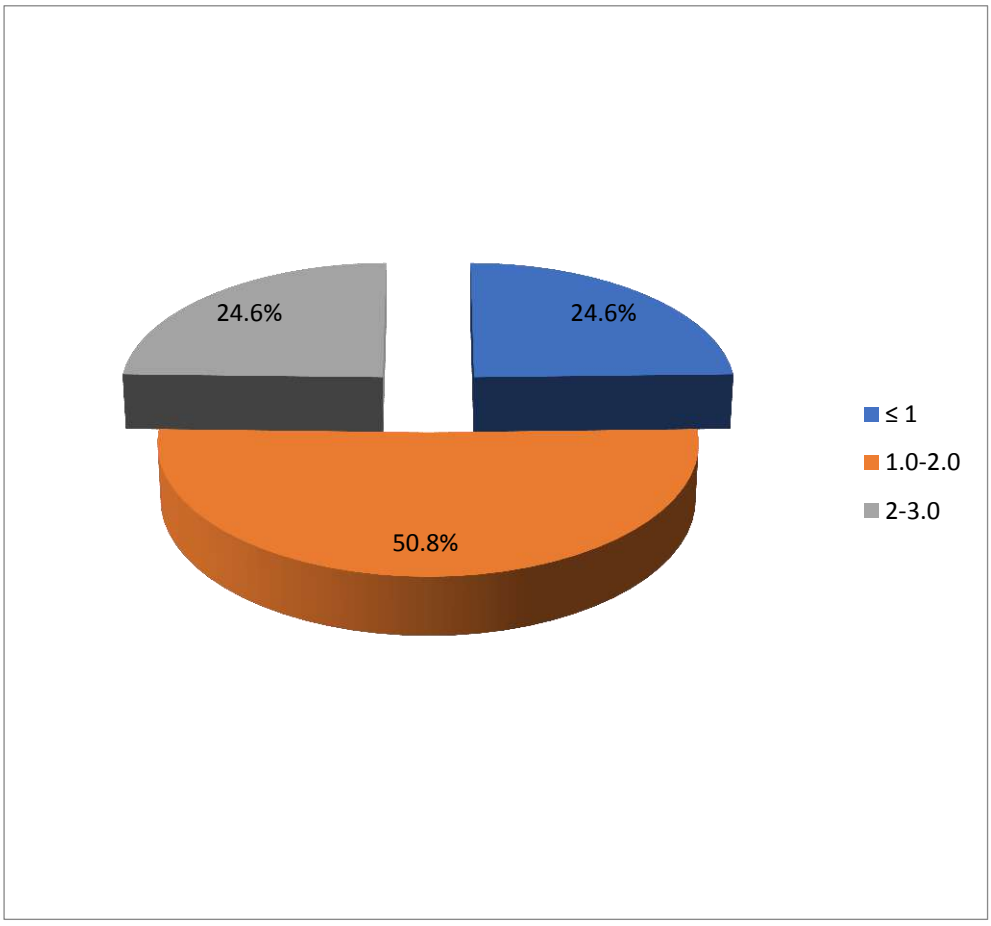

FIG. 21- HOURS OF COW MILKING PER DAY

TABLE 22- AGE DISTRIBUTION AMONG COW MILKERS WITH CTS

AGE (YEARS)	COW MILKING				Total	Chi-square value	p-value
	NO		YES				
< 30	2	1.5%	0	0.0%	2	1.086	0.581
31-60	111	82.2%	53	81.5%	164		
> 60	22	16.3%	12	18.5%	34		
Total	135	100.0%	65	100.0%	200		

53 cases (81.5%) out of 65 were in the age group of 30-60 years (p value- 0.581). The mean age of cases involved in cow milking in our study was 51.4 ± 10.5 years.

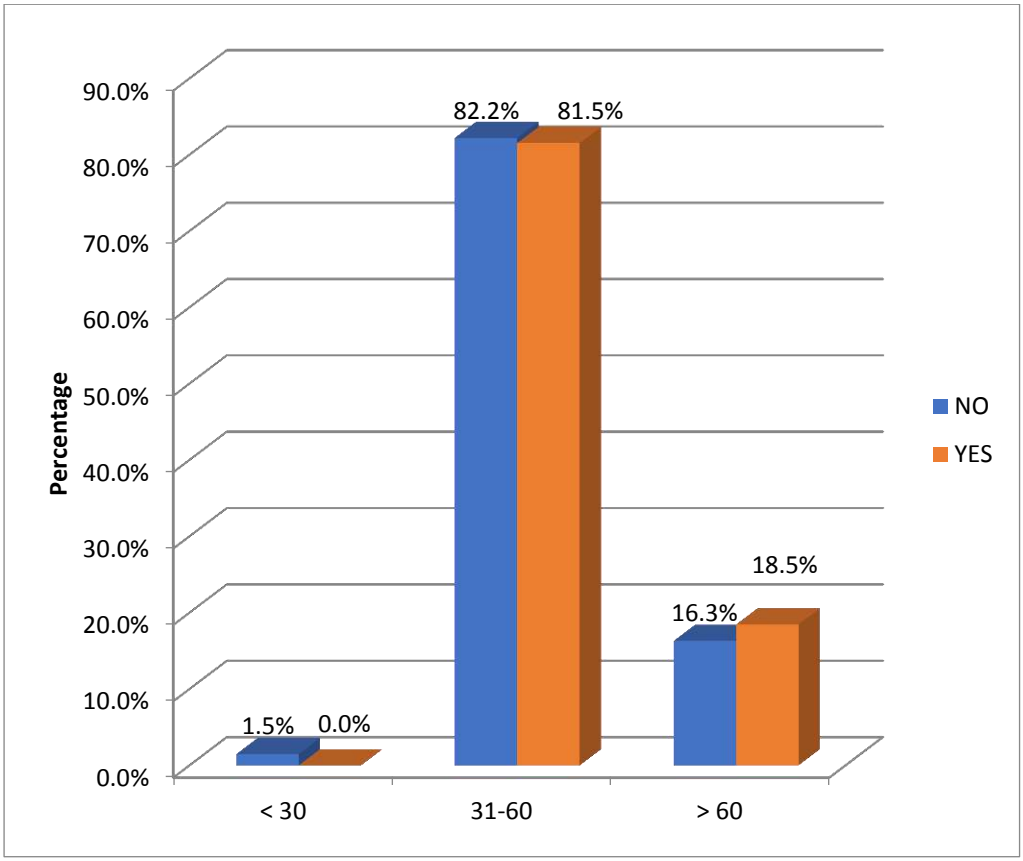

FIG.22- AGE DISTRIBUTION AMONG COW MILKERS WITH CTS

TABLE 23- SEX DISTRIBUTION AMONG COW MILKERS WITH CTS

GENDER (M/F)	COW MILKING				Total	Chi-square value	p-value
	NO		YES				
F	92	68.1%	57	87.7%	149	8.822	**0.003**
M	43	31.9%	8	12.3%	51		
Total	135	100.0%	65	100.0%	200		

Female cow milkers were more common than male cow milkers. Out of 65 cases, 57 were females and 8 were males (p value- 0.003). The female:male ratio was 7.12. There was a statistically significant difference between male and female cow milkers. Female cow milkers had a higher chance of developing CTS as compared to male cow milkers.

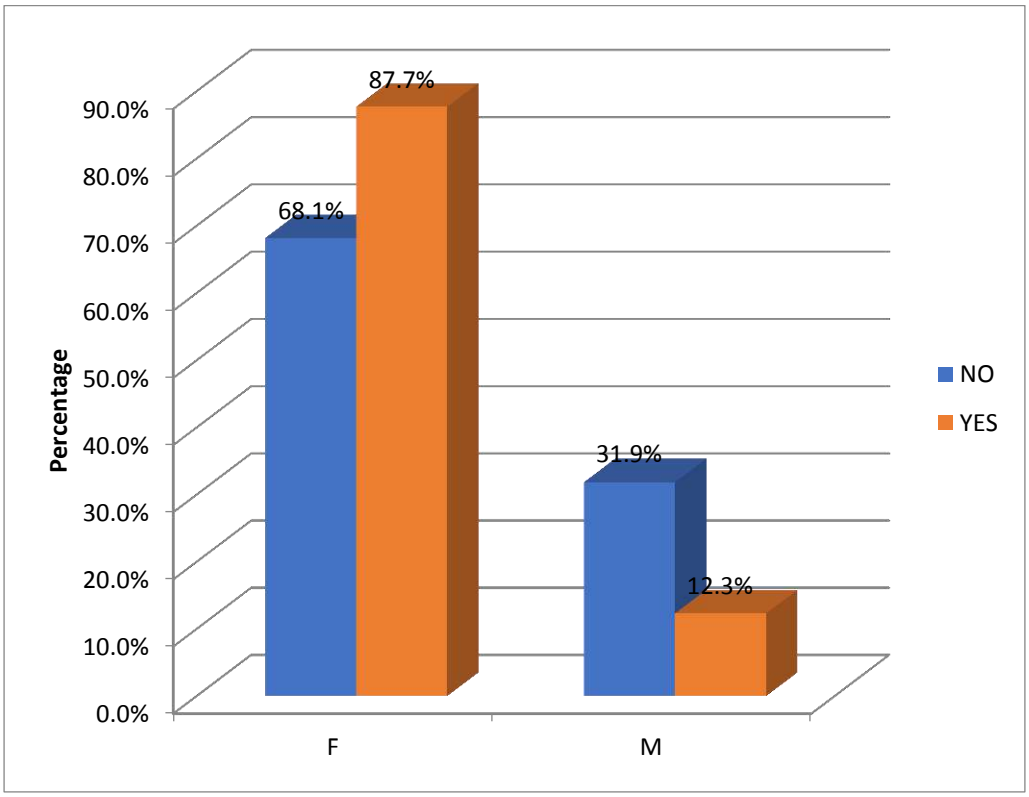

FIG.23- SEX DISTRIBUTION AMONG COW MILKERS WITH CTS

TABLE 24- BILATERAL/UNILATERAL DISTRIBUTION AMONG STUDIED MODIFIABLE RISK FACTORS

		B/U				Total	Chi-square value	p-value
		Bilateral		Unilateral				
DRIVING	NO	90	73.8%	32	26.2%	122	2.118	0.146
	YES	50	64.1%	28	35.9%	78		
WRITING WORK	NO	109	72.2%	42	27.8%	151	1.402	0.236
	YES	31	63.3%	18	36.7%	49		
COMPUTER USE	NO	116	70.3%	49	29.7%	165	0.041	0.839
	YES	24	68.6%	11	31.4%	35		
COW MILKING	NO	88	65.2%	47	34.8%	135	4.586	**0.034**
	YES	52	80.0%	13	20.0%	65		

Of the 78 cases involved in driving activity,50(64.1%) out of the 78 cases had bilateral CTS and 28(35.9%) had unilateral CTS(total 128 wrists). Of the 49 involved in writing work, 31(63.3%) cases had bilateral CTS whereas rest 18(36.7%) had unilateral CTS(total 80 wrists). 24(68.6%) out of 35 computer users had bilateral CTS whereas remaining 11(31.4%) had unilateral CTS(59 total wrists). Of the 65 cases having history of manual milking, 52 cases(80%) had bilateral carpal tunnel syndrome and only 13 cases(20%) had unilateral carpal tunnel syndrome(p value- 0.034)(total 115 wrists). There was a statistically significant association of cow milking with occurrence of bilateral CTS as compared to other modifiable risk factors.

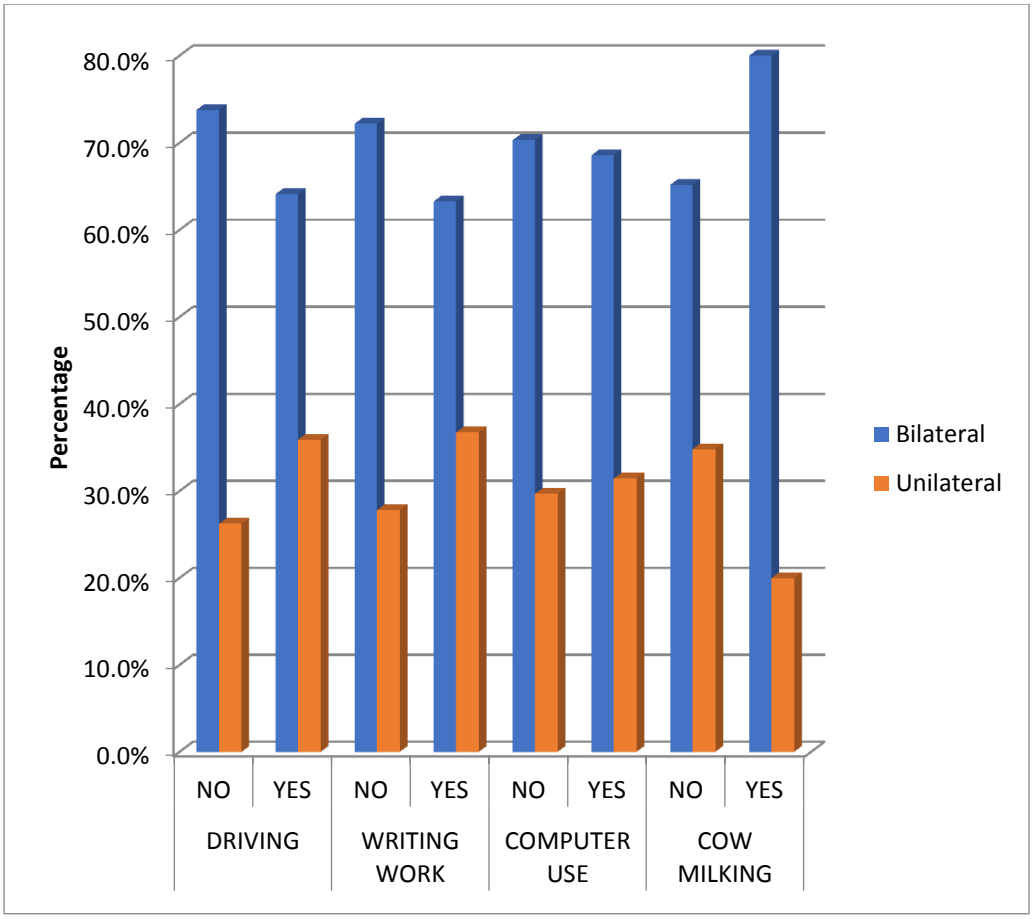

FIG. 24- BILATERAL/ UNILATERAL DISTRIBUTION AMONG STUDIED MODIFIABLE RISK FACTORS

TABLE 25- CORRELATION OF SEVERITY OF CTS WITH VARIOUS MODIFIABLE RISK FACTORS

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
DRIVING	NO	74	34.9%	138	65.1%	212	4.788	**0.029**
	YES	60	46.9%	68	53.1%	128		
WRITING WORK	NO	102	39.2%	158	60.8%	260	0.015	0.902
	YES	32	40.0%	48	60.0%	80		
COMPUTER USE	NO	109	38.8%	172	61.2%	281	0.2623	0.609
	YES	25	42.4%	34	57.6%	59		
COW MILKING	NO	91	40.8%	132	59.2%	223	0.528	0.467
	YES	43	36.8%	74	63.2%	117		

Of the 128 wrists involved in driving, 60(46.9%) wrists had mild CTS and 68(53.1%) wrists had moderate to severe CTS. (p value- 0.029). Of the 80 wrists involved in writing work, 32(40%) had mild CTS while 48(60%) had moderate to severe CTS (p value-0.902). Out of 59 wrists involved in computer use, 25(42.4%) had mild CTS whereas 34(57.6%) had moderate to severe CTS (p value-0.609). Of the 115 wrists involved in cow milking, 43 (36.8%) had mild CTS whereas 74(63.2%) had moderate to severe CTS (p value- 0.609). There was a statistically significant association of driving with severity of CTS. So, Driving is associated with more severe form of CTS.

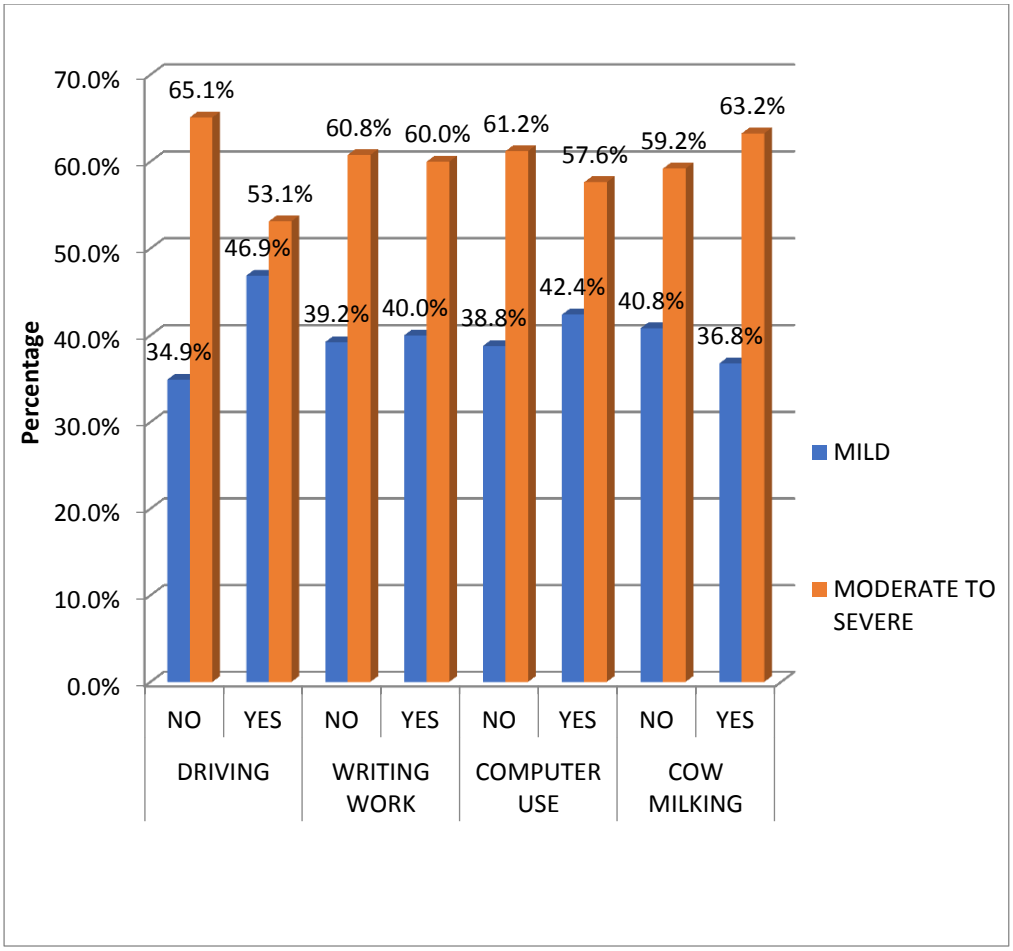

FIG.25- CORRELATION OF SEVERITY OF CTS WITH VARIOUS MODIFIABLE RISK FACTORS

TRAUMATIC CARPAL TUNNEL SYNDROME

TABLE 26- NUMBER OF CASES OF TRAUMA/FRACTURE ASSOCIATED CTS

H/O TRAUMA/FRACTURE (YES/NO)	No. of cases	Percentage
NO	178	89.0%
YES	22	11.0%
Total	200	100.0%

In our study, of 200 patients with carpal tunnel syndrome, 22 cases (11%) had a history of fracture of either arm or forearm.

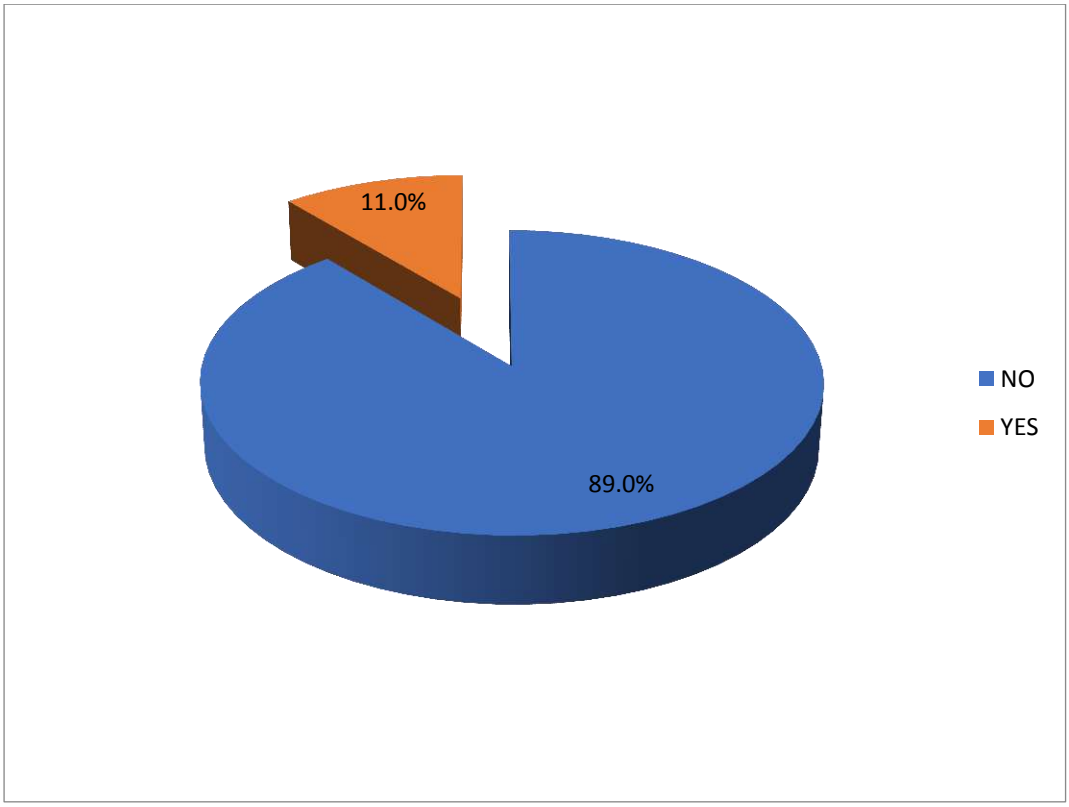

FIG. 26- NUMBER OF CASES OF TRAUMA/FRACTURE ASSOCIATED CTS

TABLE 27- BILATERAL/UNILATERAL DISTRIBUTION OF TRAUMATIC CTS

		B/U				Total	Chi-square value	p-value
		Bilateral		Unilateral				
H/O TRAUMA OR FRACTURE (YES/NO)	NO	131	73.6%	47	26.4%	178	9.962	**0.003**
	YES	9	40.9%	13	59.1%	22		

Of the 22 cases with history of fracture, 9(40.9%) developed bilateral CTS whereas 11(59.1%) developed unilateral CTS (p value-0.003). There was a statistically significant association of CTS with site of trauma. Fractures/injuries tend to cause unilateral CTS on the same side.

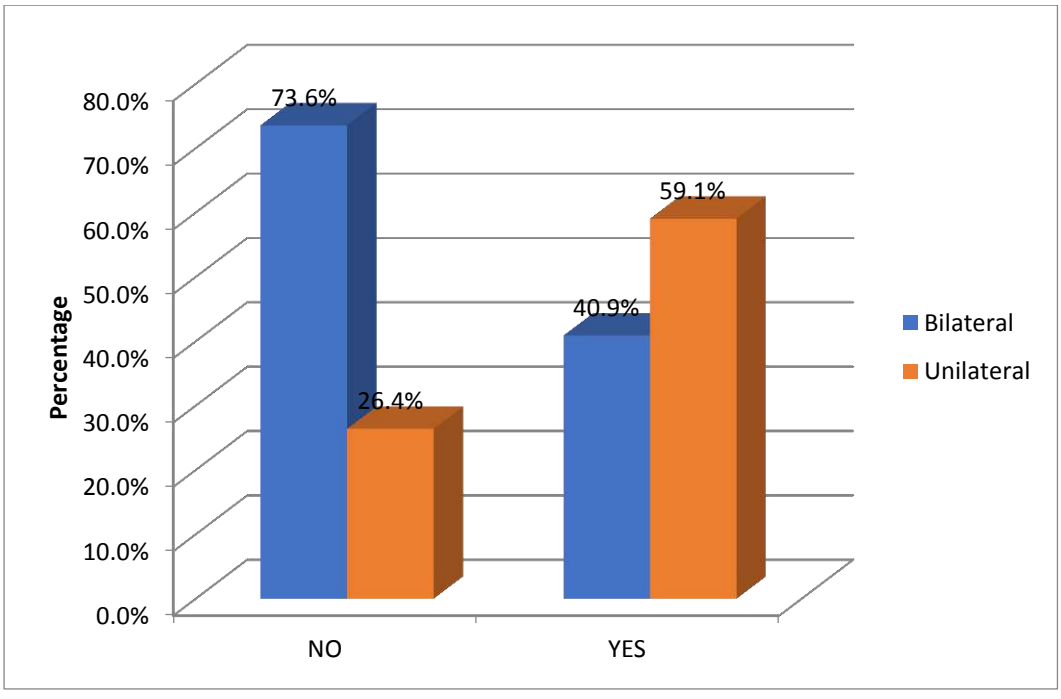

FIG. 27- BILATERAL/UNILATERAL DISTRIBUTION OF TRAUMATIC CTS

PRESENTING CLINICAL FEATURES

TABLE 28- PRESENTING SYMPTOMS IN PATIENTS WITH CTS

	PRESENT		ABSENT	
	No. of cases	Percentage	No. of cases	Percentage
PAIN	159	79.5%	41	20.5%
TINGLING	152	76.0%	48	24.0%
NUMBNESS	186	93.0%	14	7.0%

The most common presenting symptom in our study was numbness (93%) followed by pain in the hand on the affected side (79.5%) and Tingling or paraesthesia (76%).

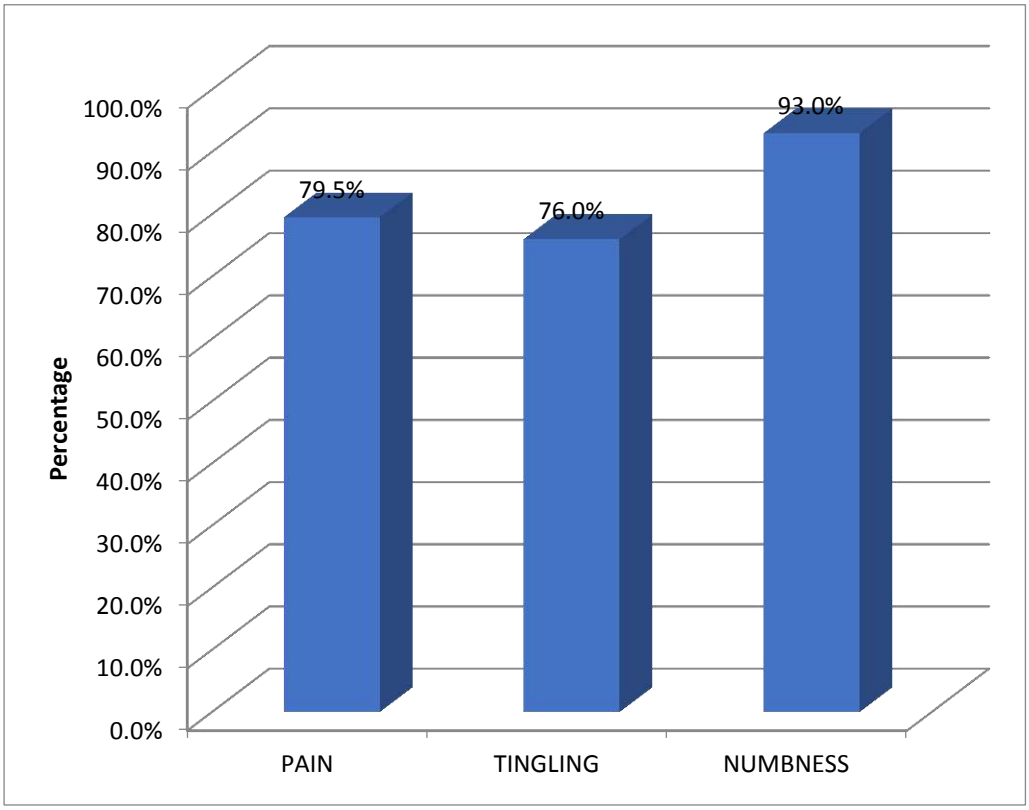

FIG.28- PRESENTING SYMPTOMS IN PATIENTS WITH CTS

TABLE 29- NOCTURNAL SYMPTOMS IN PATIENTS WITH CTS

NOCTURNAL SYMPTOMS(YES/NO)	No. of cases	Percentage
NO	50	25.0%
YES	150	75.0%
Total	200	100.0%

75% cases reported nocturnal symptoms and confessed to have disturbed sleep and nocturnal awakenings due to these symptoms.

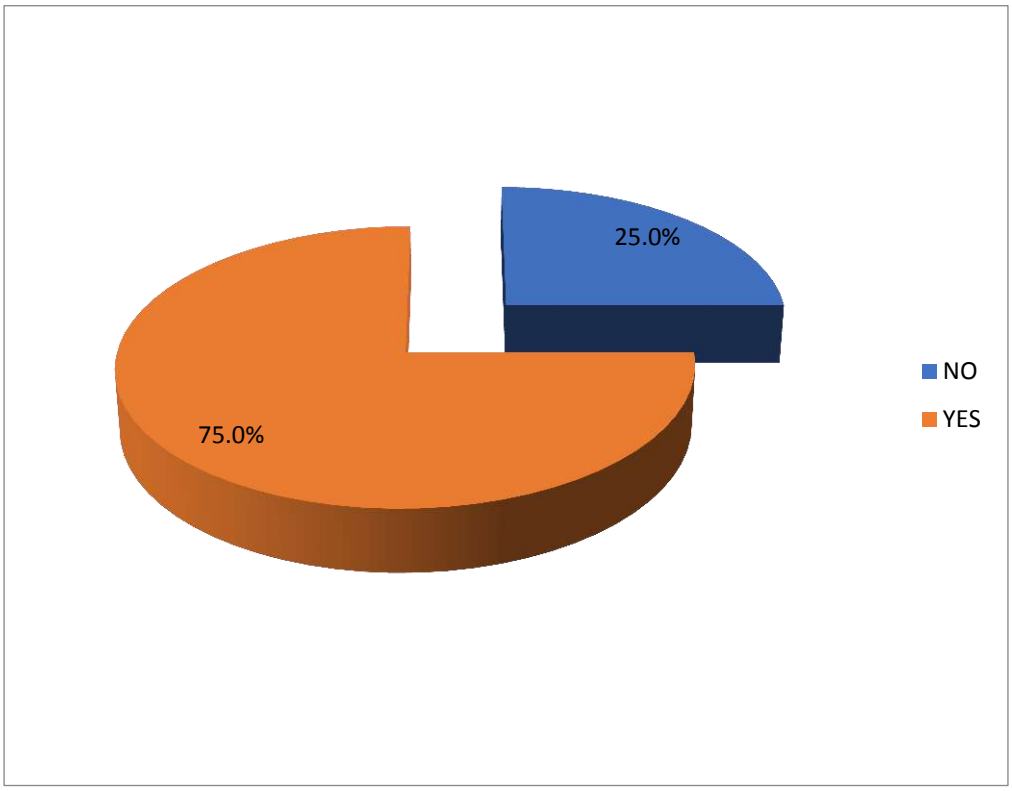

FIG. 29- NOCTURNAL SYMPTOMS IN PATIENTS WITH CTS

TABLE 30- BILATERAL/UNILATERAL DISTRIBUTION IN CTS PATIENTS WITH NUMBNESS

		B/U				Total	Chi-square value	p-value
		Bilateral		Unilateral				
NUMBNESS (YES/NO)	NO	11	78.6%	3	21.4%	14	0.762	0.683
	YES	129	69.4%	57	30.6%	186		

Out of 186 patients presenting with numbness, 129 (69.4%) had bilateral disease and 57 (30.6%) had unilateral disease (total 315 wrists) (p value- 0.683).

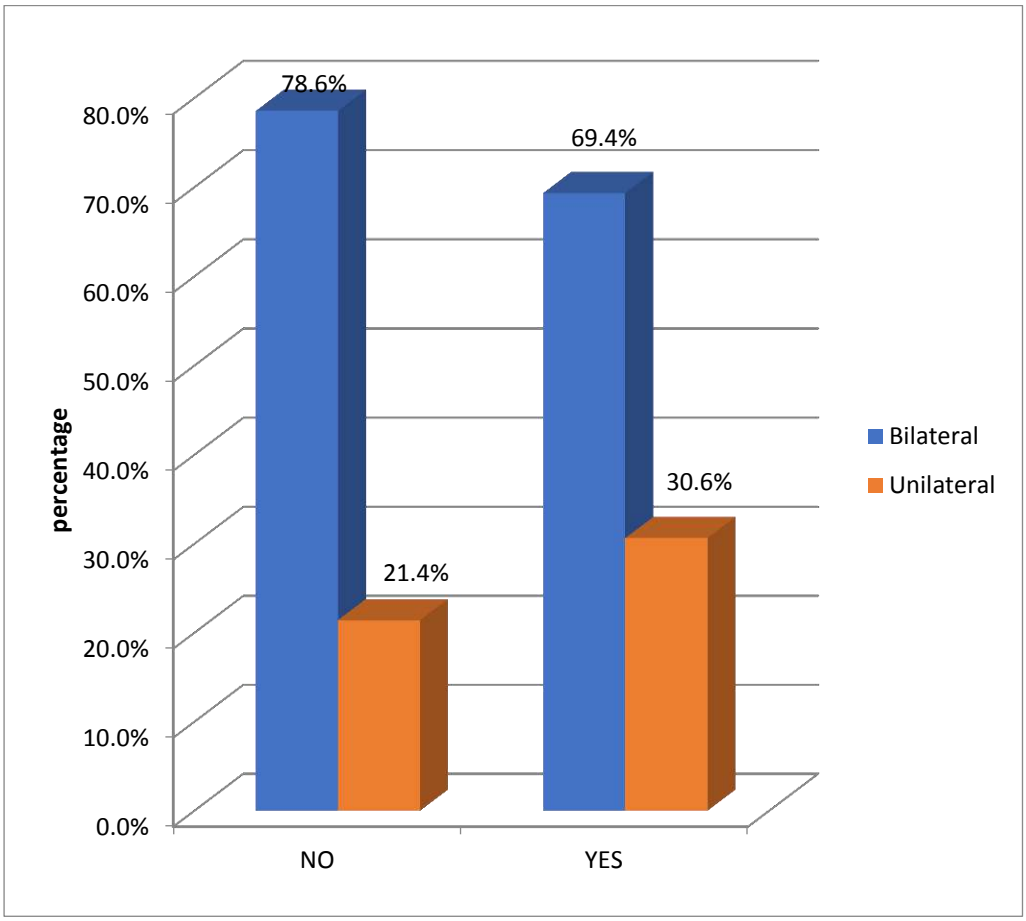

FIG.30- BILATERAL/UNILATERAL DISTRIBUTION IN CTS PATIENTS WITH NUMBNESS

TABLE 31- SEVERITY OF CTS IN PATIENTS WITH NUMBNESS

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE			4.790	**0.029**
NUMBNESS (YES/NO)	NO	15	60.0%	10	40.0%	25		
	YES	119	37.8%	196	62.2%	315		

However, of the 315 wrists with numbness, 119 (37.8%) had mild CTS while 196 (62.2%) had moderate to severe CTS (p value-0.029). There was statistically significant association between presence of numbness and severity of disease. Numbness was a marker of severe form of CTS.

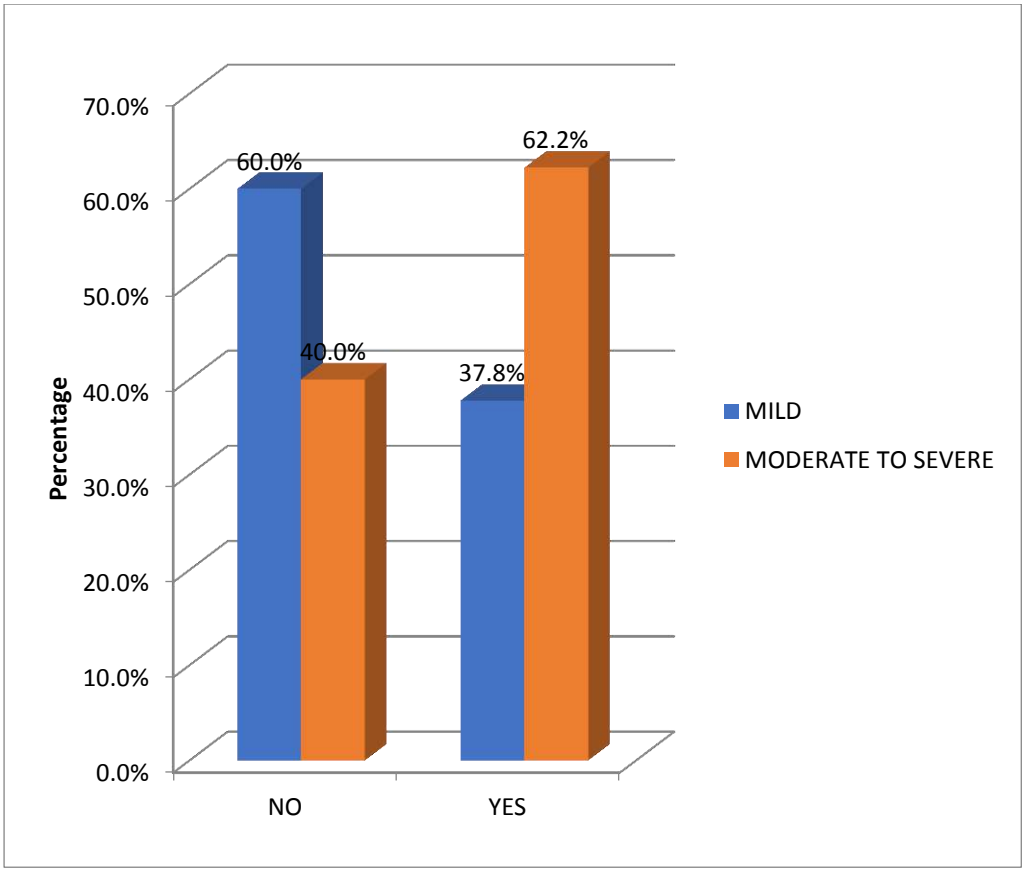

FIG.31- SEVERITY OF CTS IN PATIENTS WITH NUMBNESS

CORRELATION OF CLINICAL TESTS WITH DIAGNOSIS OF CTS

TABLE 32- SENSITIVITY OF PROVOCATIVE TESTS IN CTS PATIENTS

	POSITIVE		NEGATIVE	
	No. of cases	Percentage	No. of cases	Percentage
PHALEN TEST	247	72.6%	93	27.4%
TINEL SIGN	35	10.3%	305	89.7%
DURKEN TEST	99	29.1%	241	70.9%

In our study, phalen test was positive in 247 out of 340 CTS wrists (72.6%), tinel sign was positive in 35 out of 340 CTS wrists (10.3%) and durken test was positive in 99 out of 340 CTS wrists(29.1%).

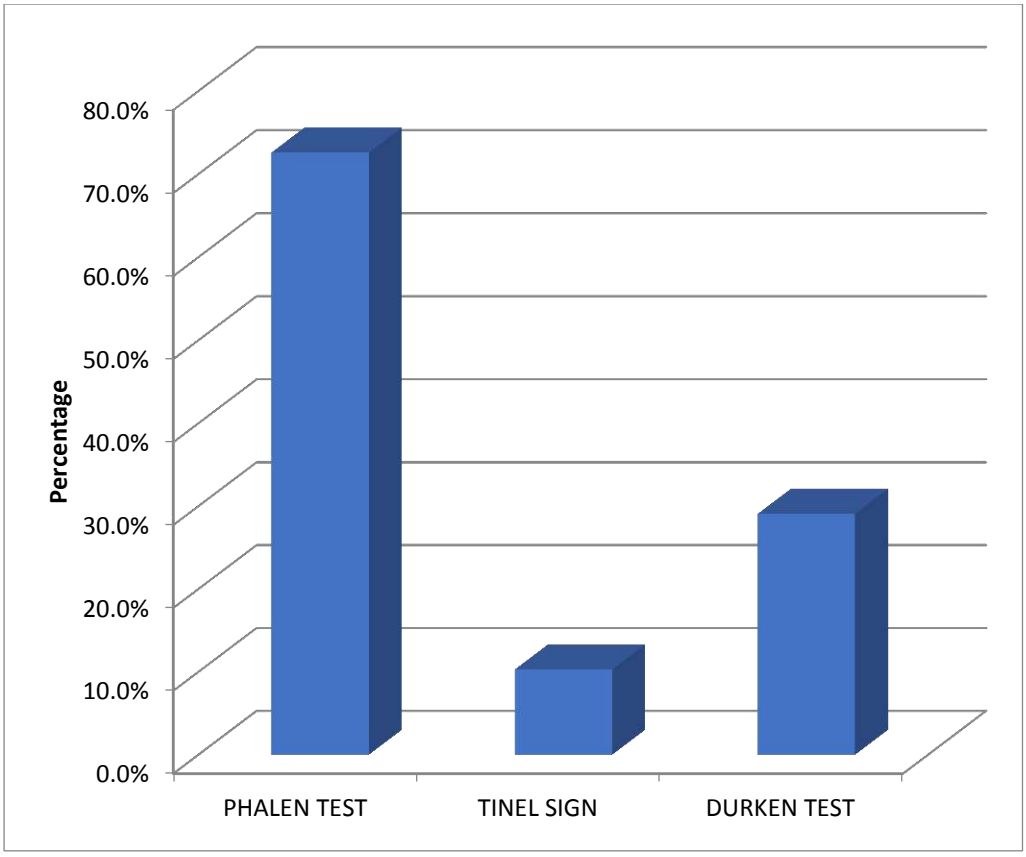

FIG.32- SENSITIVITY OF PROVOCATIVE TESTS IN CTS PATIENTS

TABLE 33- SEVERITY OF CTS IN PATIENTS WITH POSITIVE DURKEN TEST

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
DURKEN TEST	ABSENT	110	45.6%	131	54.4%	241	13.459	**0.001**
	PRESENT	24	24.2%	75	75.8%	99		

Out of 99 wrists with positive durken test, 24 (24.2%) had mild CTS whereas 75 (75.8%) had moderate to severe CTS (p value-0.001). There was a statistically significant correlation between positive durken Test and severity of disease. So, durken test was a marker of severe form of disease.

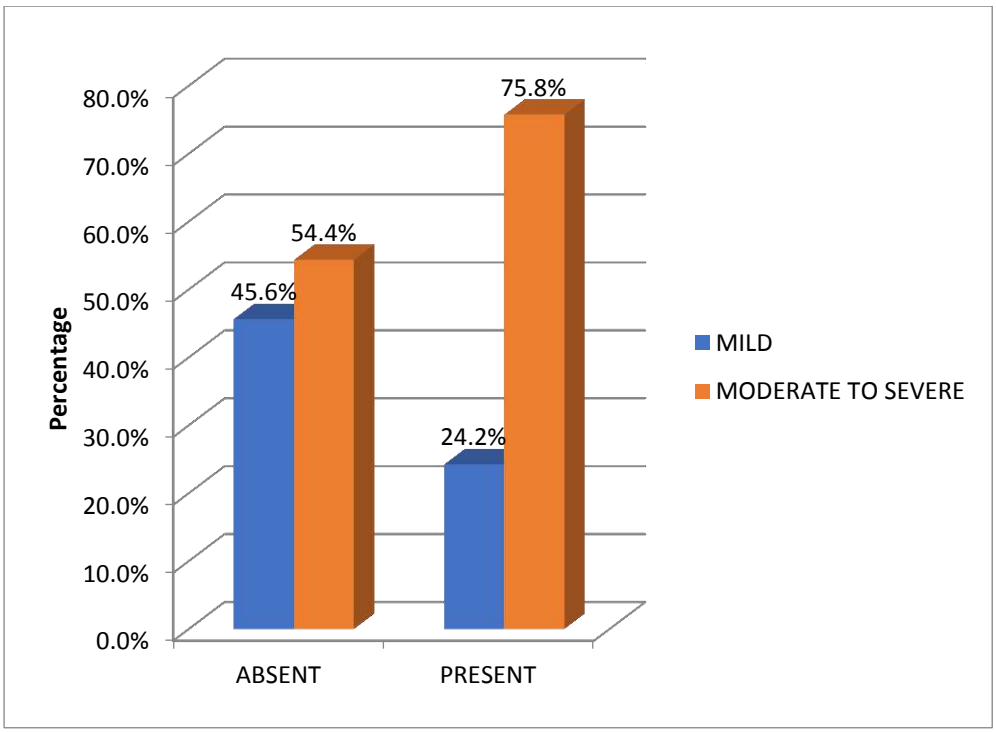

FIG. 33- SEVERITY OF CTS IN PATIENTS WITH POSITIVE DURKEN TEST

ETIOLOGY

DIABETES -

TABLE 34- NUMBER OF CTS CASES WITH DIABETES

H/O DIABETES	No. of cases	Percentage
NO	131	65.5%
YES	69	34.5%
Total	200	100.0%

In our study, 69 cases (34.5%) were suffering from diabetes mellitus.

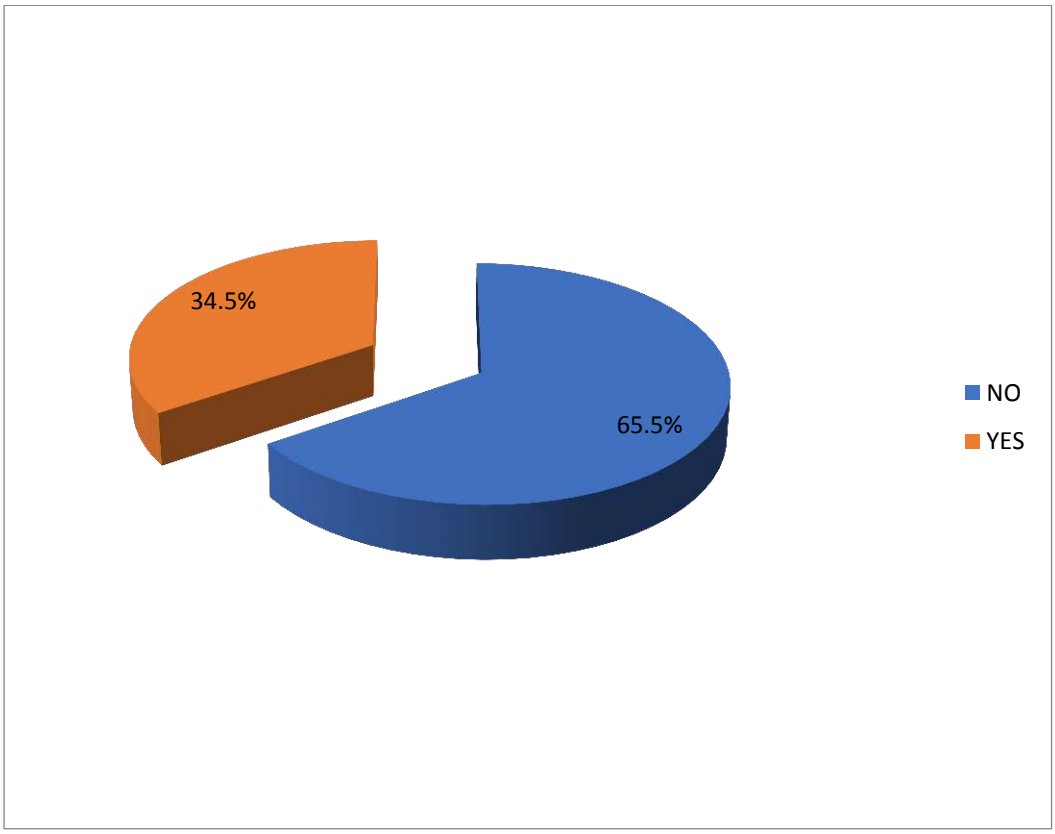

FIG.34- NUMBER OF CTS CASES WITH DIABETES

TABLE 35- DURATION OF DIABETES IN CTS PATIENTS

DURATION(YEARS)	No. of cases	Percentage
<5	14	20.3%
5-10.0	18	26.1%
10-15.0	13	18.8%
15-20.0	13	18.8%
≥20	11	15.9%
Total	69	100.0%

55(79.7%) of 69 cases had been diabetic for more than 5 years.

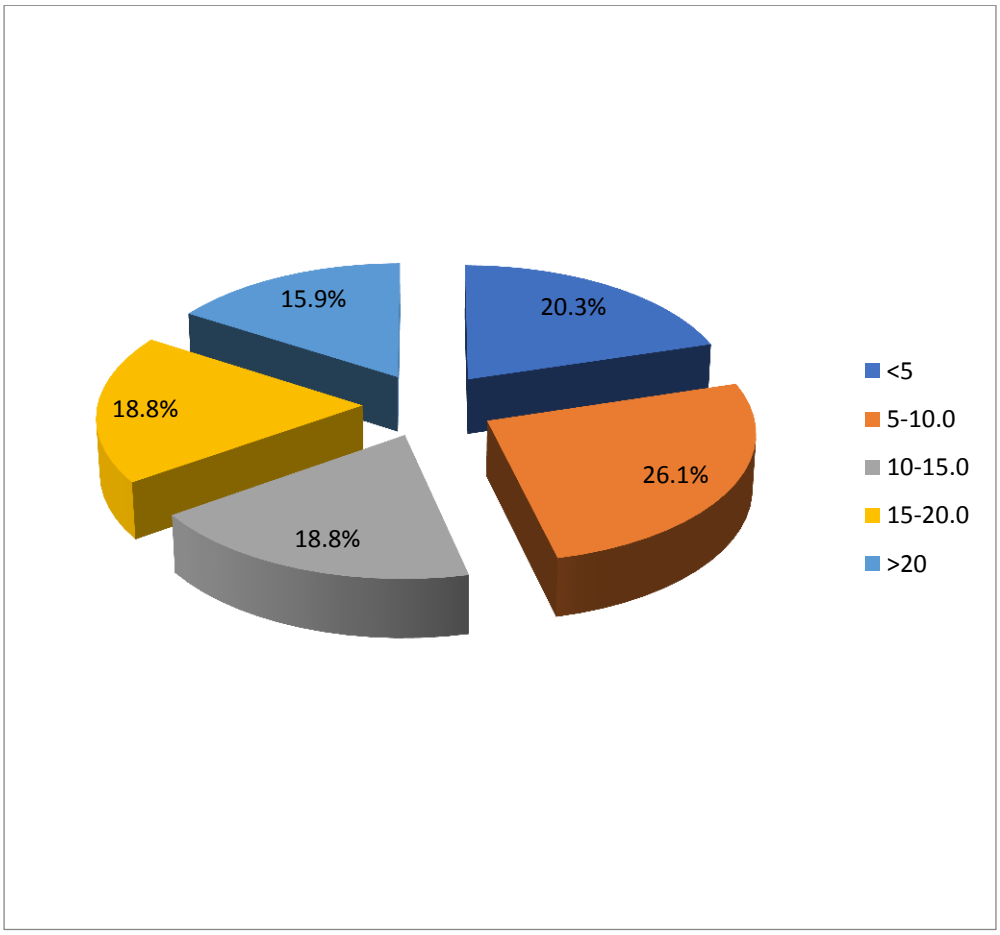

FIG.35- DURATION OF DIABETES IN CTS PATIENTS

TABLE 36- BILATERAL/UNILATERAL DISTRIBUTION IN CTS PATIENTS WITH DIABETES

		B/U				Total	Chi-square value	p-value
		Bilateral		Unilateral				
H/O DIABETES	NO	88	67.2%	43	32.8%	131	1.442	0.230
	YES	52	75.4%	17	24.6%	69		

Of the 69 diabetics, 52 cases (75.4%) had bilateral CTS and remaining 17(24.6%) cases had unilateral cases(total 121 wrists).

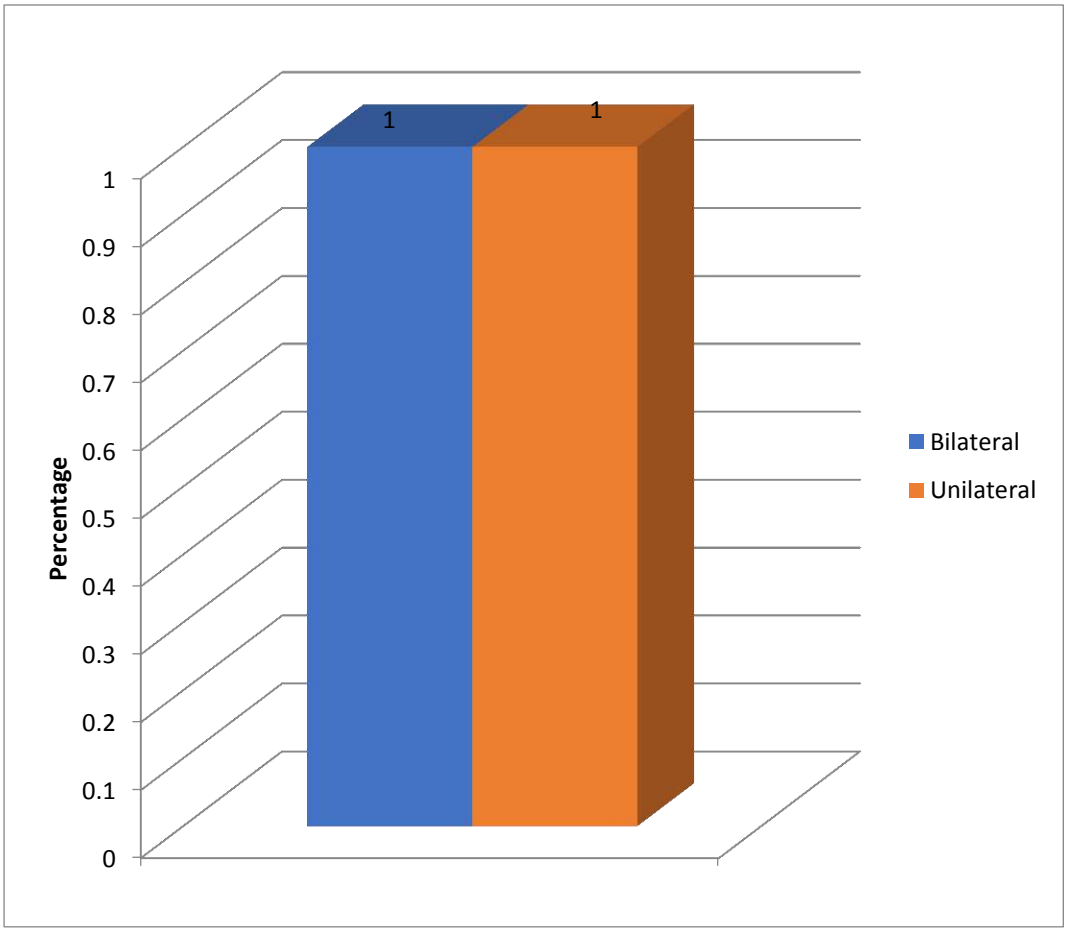

FIG.36- BILATERAL/UNILATERAL DISTRIBUTION IN CTS PATIENTS WITH DIABETES

TABLE 37- SEVERITY OF CTS IN CASES WITH DIABETES

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
DIABETES	NO	86	39.3%	133	60.7%	219		
	YES	48	39.7%	73	60.3%	121	0.005	0.942

Out of 121 wrists of diabetics, 48 had mild CTS and 73 (60.3%) had moderate to severe CTS.

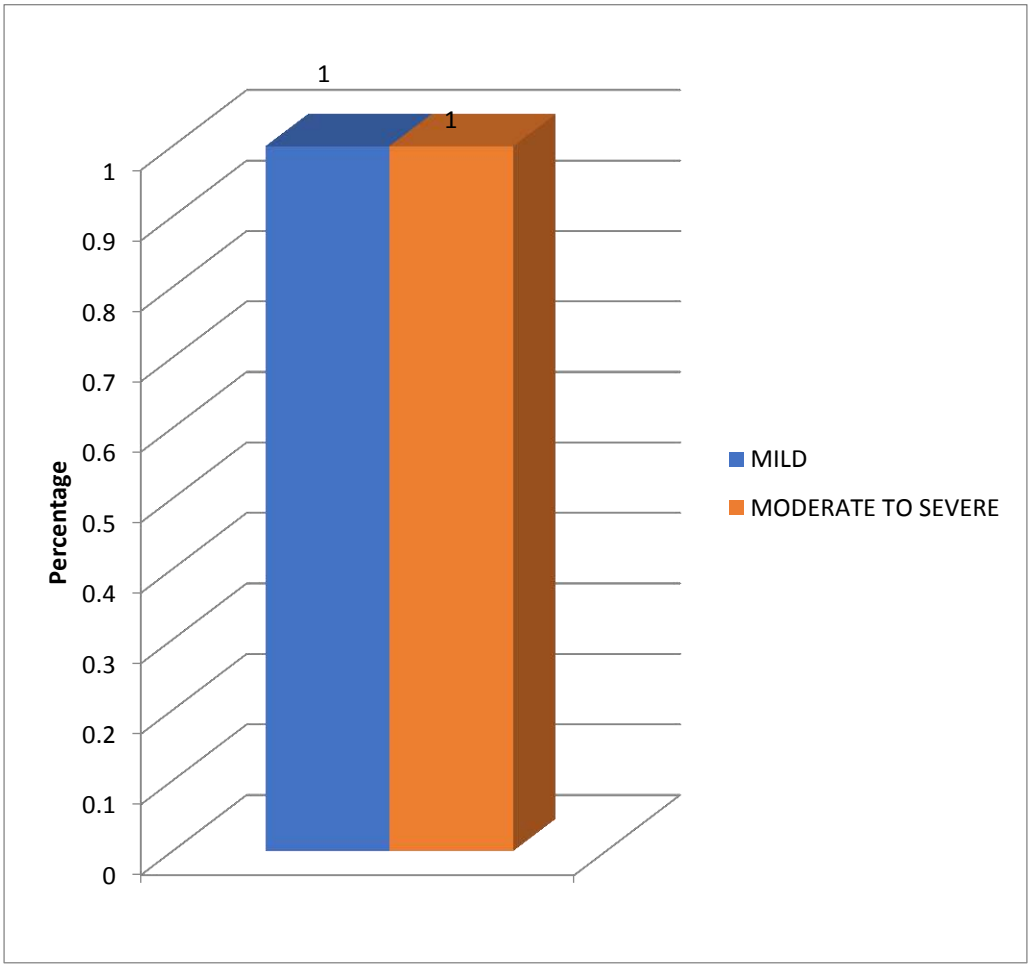

FIG.37- SEVERITY OF CTS IN CASES WITH DIABETES

HYPOTHYROIDISM -

TABLE 38- NUMBER OF CTS CASES WITH HYPOTHYROIDISM

H/O HYPOTHYROIDISM	No. of cases	Percentage
NO	151	75.5%
YES	49	24.5%
Total	200	100.0%

In our study, Hypothyroidism was observed in 49 (24.5%) cases.

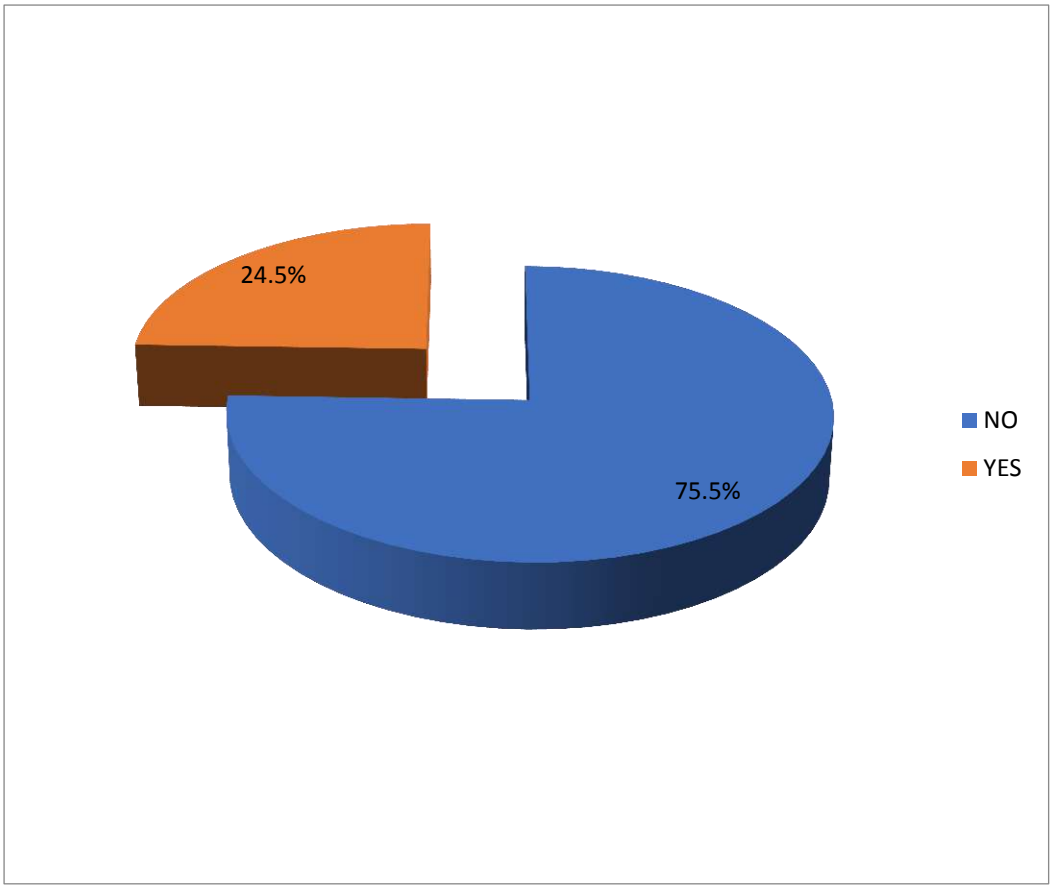

FIG. 38- NUMBER OF CTS CASES WITH HYPOTHYROIDISM

TABLE 39- DURATION OF HYPOTHYROIDISM IN CTS PATIENTS

DURATION(YEARS)	No. of cases	Percentage
<5	6	12.2%
5-10.0	24	49.0%
≥10	19	38.8%
Total	49	100.0%

43 (87.8%) cases had been hypothyroid for >5 years and were on treatment for the same.

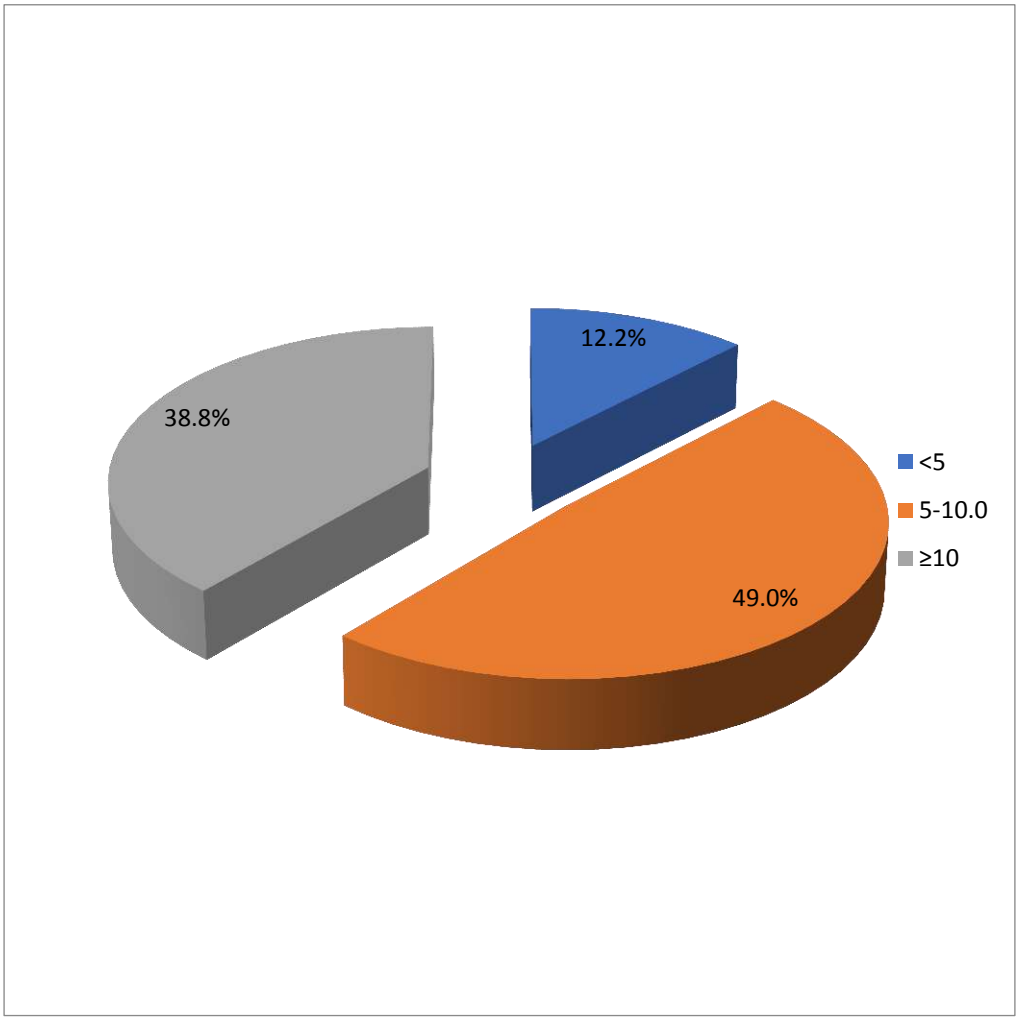

FIG.39- DURATION OF HYPOTHYROIDISM IN CTS PATIENTS

TABLE 40- BILATERAL/UNILATERAL DISTRIBUTION IN CTS PATIENTS WITH HYPOTHYROIDISM

		B/U				Total	Chi-square value	p-value
		Bilateral		Unilateral				
H/O HYPOTHYROIDISM	NO	102	67.5%	49	32.5%	151	1.762	0.184
	YES	38	77.6%	11	22.4%	49		

Out of 49 cases, 38 cases (77.6%) had bilateral CTS and remaining 11(22.4%) cases had unilateral cases(total 87 wrists).

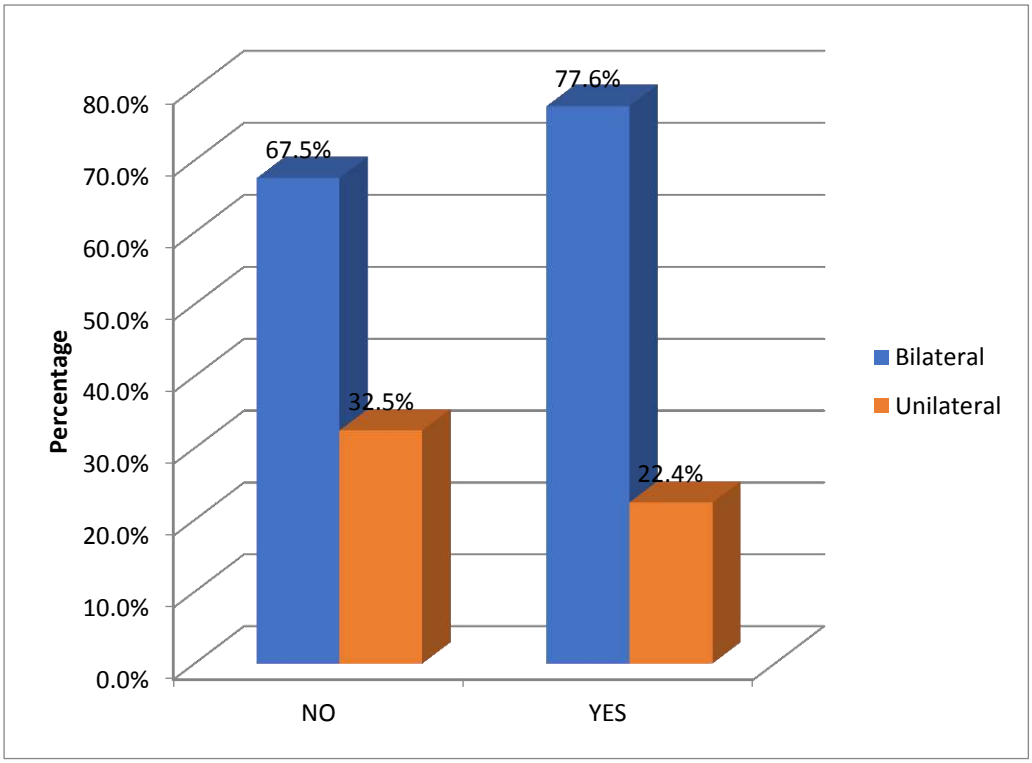

FIG. 40- BILATERAL/UNILATERAL DISTRIBUTION IN CTS PATIENTS WITH HYPOTHYROIDISM

TABLE 41- SEVERITY OF CTS IN CASES WITH HYPOTHYROIDISM

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
H/O HYPOTHYROIDISM	NO	97	38.3%	156	61.7%	253	0.476	0.490
	YES	37	42.5%	50	57.5%	87		

Of 87 wrists of hypothyroid patients, 37 had mild CTS (42.5%) and 50 had moderate to severe CTS (57.5%).

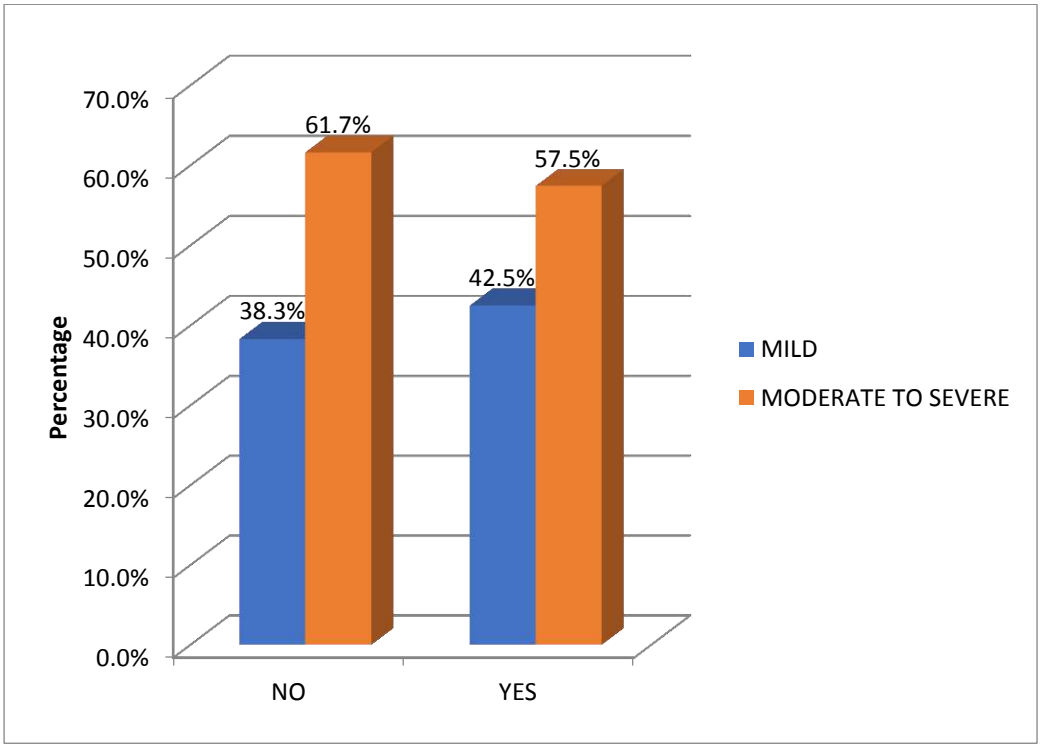

FIG.41- SEVERITY OF CTS IN CASES WITH HYPOTHYROIDISM

RHEUMATOID ARTHRITIS-

TABLE 42- NUMBER OF CTS CASES WITH RHEUMATOID ARTHRITIS

H/O RHEUMATOID ARTHRITIS	No. of cases	Percentage
NO	185	92.5%
YES	15	7.5%
Total	200	100.0%

In our study, there were 15 patients (7.5%) who were suffering from rheumatoid arthritis.

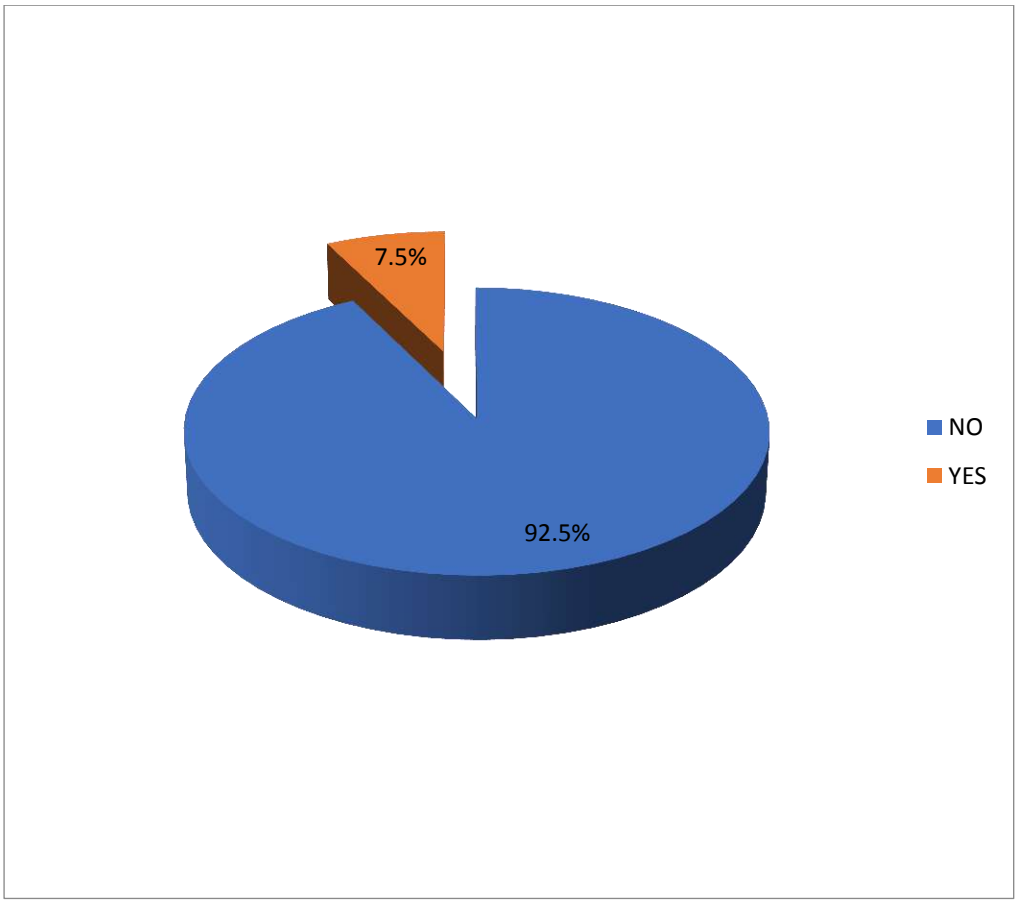

FIG 42- NUMBER OF CTS CASES WITH RHEUMATOID ARTHRITIS

TABLE 43- SEVERITY OF CTS IN CASES WITH RHEUMATOID ARTHRITIS

		GRADE				Total	Chi-square value	p-value
		MILD		MODERATE TO SEVERE				
H/O RHEUMATOID ARTHRITIS	NO	126	40.3%	187	59.7%	313	1.175	0.278
	YES	8	29.6%	19	70.4%	27		

Of the 27 wrists having rheumatoid arthritis, 70.4% had moderate to severe CTS.

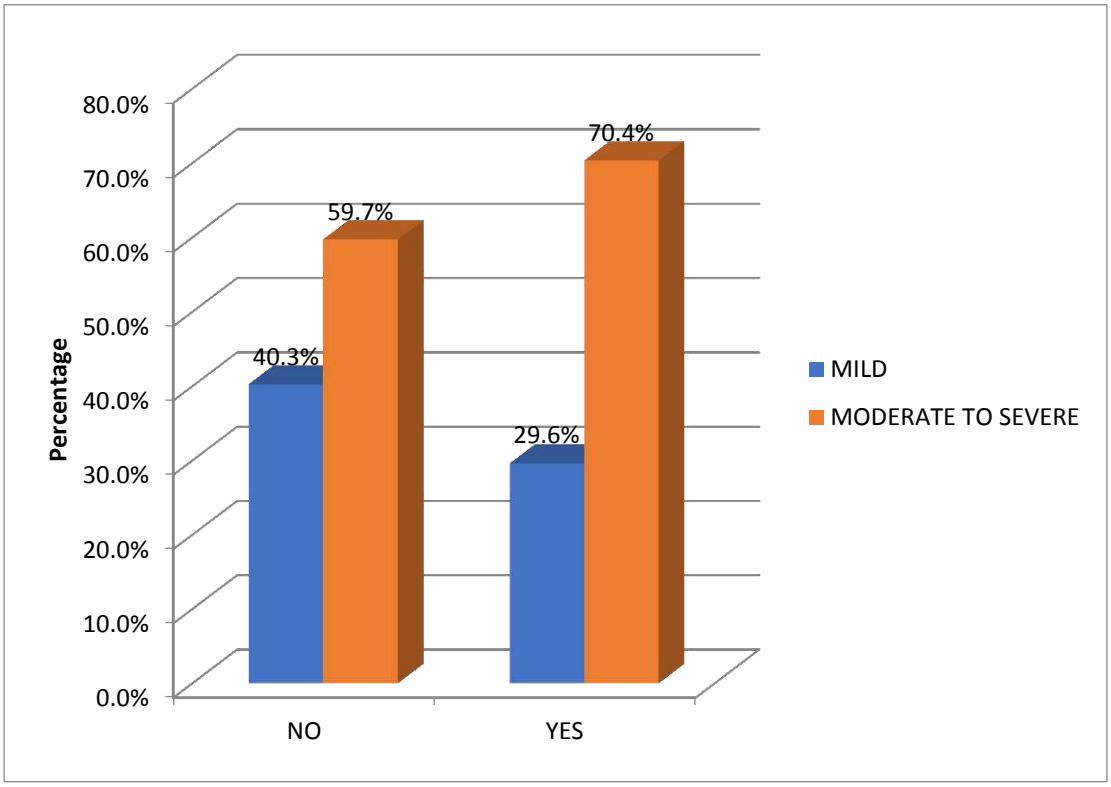

FIG.43- SEVERITY OF CTS IN CASES WITH RHEUMATOID ARTHRITIS

PREGNANCY -

TABLE 44- TIME FROM LAST PREGNANCY IN FEMALE PATIENTS WITH CTS

LAST PREGNANCY DURATION(YEARS)	No. of cases	Percentage
<1	1	0.7%
1-5.0	39	26.2%
5-10.0	17	11.4%
10-15.0	24	16.1%
15-20.0	19	12.8%
≥20	49	32.9%
Total	149	100.0%

In our study, no pregnant patient presented to the facility. However, 40 females (26.8%) out of 149 included in the study had a pregnancy within 5 years of date of presentation. Duration to last pregnancy for the rest of the cases was more than 5 years.

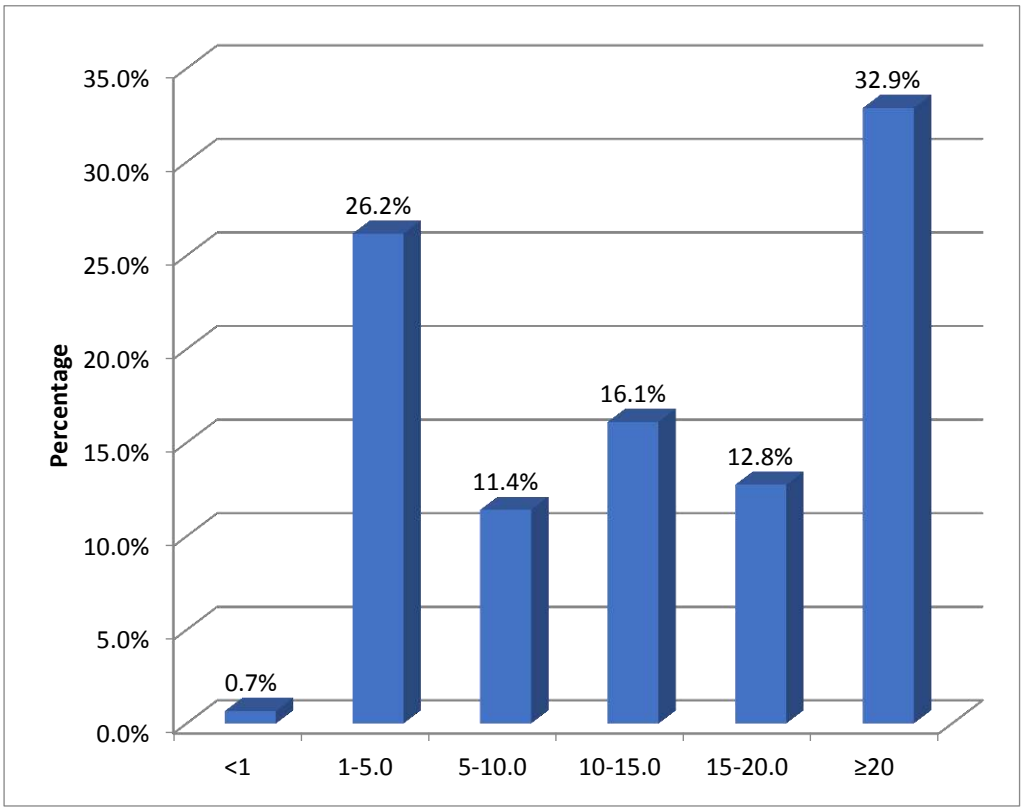

FIG.44- TIME FROM LAST PREGNANCY IN FEMALE PATIENTS WITH CTS

DISCUSSION

This study was conducted in a tertiary care hospital of north India. It was a prospective observational study involving 200 patients with 340 hands of CTS diagnosed on nerve conduction studies. The statistical data obtained at the end of the study was compared with previously published literatures.

Out of the total 400 wrists (200 patients), carpal tunnel syndrome was present in 340 wrists in our study.

CLINICAL CHARACTERISTICS

AGE DISTRIBUTION

Most patients in our study were in the age group between 51-60 years (32%), followed by 41-50 years (26%) and 31-40 years(22.5%). In this study, more than two thirds (73.5%) of total patients belonged to 41-70 years of age group. The mean age of presentation was 49.73 $\pm$ 10.9 years. Tay L B et al [63] found that more than two-thirds of total 134 patients in their study were between 40-70 years of age and the mean age of presentation was 53.6 years. This suggests that CTS is a disease of middle to elderly age group which is comparable to previous studies.

SEX DISTRIBUTION

In our study, there were 149 females (74.5%) and 51 males (25.5%). There was a female preponderance with female:male ratio of 2.9.Out of 83 wrists of the male participants, 35 (42.2%) wrists had mild CTS and 48 (57.8%) had moderate to severe CTS. On the other hand, of the 257 wrists of female participants, 99(38.5%) wrists had mild CTS whereas 158 (61.5%) wrists had moderate to severe CTS (p value-0.554). According to the study conducted by Mondelli et al [2], carpal tunnel syndrome (CTS) is the most commonly-encountered entrapment neuropathy with an incidence more in women as compared to men. In the studies conducted by Phalen et al [64] and Radecki P et al [65], 3-4 times higher incidence of carpal tunnel syndrome in females has been observed. In a study from Canterbury and Huddersfield, UK, Bland et al [34] reported female to male ratio of 2.07 with females almost twice as

commonly affected as males. In India, as per the study conducted by Sharief et al [35], 64% were female subjects out of total 100 participants. The findings in the current study were similar to that of these studies with female:male ratio of 2.9.

BMI DISTRIBUTION

In our study, out of 200 cases, 106(53%) cases fell in the category of overweight (BMI 25-30 kg/m2) followed by 66(33%) who were in obese category (BMI>30kg/m2). Rest 28 (14%) cases were having BMI <25kg/m2. In our study, we found CTS more in overweight group. In a study conducted by Sharief et al [35], 51% of the total 100 participants were overweight as defined by BMI. According to a study by Mansoor et al [37], out of 112 patients, 74 patients (66%) were of normal weight (BMI<25), and 38(34%) were obese (BMI>30). The findings in our study correlated with the findings of these studies.

In our study, in candidates having overweight (BMI 25-30), 81(44%) wrists had mild CTS while 103(56%) wrists had moderate to severe CTS. In obese group (BMI>30), 39(33.6%) wrists had mild CTS whereas 77(66.4%) had moderate CTS.

There is an increased incidence of developing CTS in obese patients as compared to normal population due to increased fat deposition under flexor retinaculum leading to increased pressure and early compression of median nerve.

OCCUPATION

Based on the occupation, all the participants in the study were divided into 2 categories- non skilled workers and skilled workers. Non-skilled workers group included housewives, retired persons and students. Skilled Workers group was further subdivided into occupations requiring significant use of hands and occupations requiring mild use of hands. The former subcategory included agriculture workers, farmers, carpenters, drivers, labourers, milkmen. However, service sector, shopkeepers, businessmen and self-employed persons belonged to the latter subcategory.

In our study, the non-skilled workers group constituted the major bulk with 115(57.5%) patients belonging to the same while 85(42.5%)

belonged to the skilled workers group. Of these 85, 64(32%) cases belonged to occupations requiring mild use of hands and 21(10.5%) cases belonged to occupations requiring significant use of hands.

Previous studies have shown a higher incidence of CTS in workers who were involved in work associated with high force and repetitive activity [66-69]. In a study by Silverstein et al [66], prevalence of CTS was 5.6% among workers in high force and high repetitive jobs as compared to 0.6% among workers who had low force and low repetitive job profile. Palmer et al [70], found that the regular use of hand-held vibrating tools increased the risk of CTS by more than 2-fold. However, in our study, patients predominantly belonged to non-skilled workers group rather than skilled workers group. There was more dominance of female patients as compared to male patients. Secondly, in India, females are more involved in household work and males are involved in outside work. So, proportion of non-workers was significantly high in our study as compared to workers involved in hand using activities contrary to other studies. Also, the number of cases belonging to group which require significant use of hands were less as these patients belonged to rural area and number of rural area residents visiting our tertiary care hospital were less.

CATEGORISING THE MODIFIABLE RISK FACTORS

1.DRIVING

In our study, 78 participants out of 200 (39%) had a history of driving a vehicle (two wheeler/ four wheeler). 38.5% had been driving a vehicle for 5-10 years. 51.28% of the participants had a history of driving a vehicle for more than 10 years. 64.1% cases had been driving a vehicle daily for 1 hour. The mean duration of driving in years was 14.5 $\pm$ 17.4 years. However, the mean duration of driving hours per day was 1.65 $\pm$ 1.6 hours/day. 50 (64.1%) out of the 78 cases had bilateral CTS and 28 (35.9%) had unilateral CTS (total 128 wrists). Of the 128 wrists, 60 (46.9%) wrists had mild CTS and 68(53.1%) wrists had moderate to severe CTS (p value- 0.029). On asking history, 67(85.8%) of the 78 participants reported worsening of CTS symptoms on driving a vehicle.

Our study found a significant correlation of driving with presence of severe form of CTS. This association has not been studied in previous studies. This can be based on the fact that driving involves constant use of hands and multiple episodes of wrist flexion and extension leading to increased tension within the carpal tunnel. Thus, predisposing patient to develop CTS.

2. WRITING

24.5% (49 out of 200) cases were involved in constant writing work. Out of these, 73.5% had been involved in such activity for more than 10 years and 79.5% had a history of performing writing work for >2 hours a day. The mean duration of performing writing work in years was 18.5 ± 8.6 years. However, the mean duration of performing writing work in hours per day was 3.3 ± 1.1 hours/day. 31(63.3%) cases out of 49 had bilateral CTS whereas rest 18(36.7%) had unilateral CTS (total 80 wrists). Of the 80 wrists, 32 (40%) had mild CTS while 48(60%) had moderate to severe CTS (p value-0.902). Of the 49 cases, 44(89.8%) reported worsening of CTS symptoms on performing writing work for long hours. Association between long hours of writing and CTS has not been established in previous studies. Though there was no significant correlation of long hours of writing with presence and severity of CTS in our study.

3. COMPUTER USE

In our study, 35 (17.5%) cases had a history of computer use. Out of these, 27 (77.1%) had been using a computer for more than 5 years. Most cases (18) had been using a computer for 1-2 hours a day (51.4%). The mean years of computer use was found to be 9.1 ± 3.5 years and the mean hours of computer use per day was 2.43 ± 0.97 hours/day. 24 (68.6%) out of 35 had bilateral CTS whereas remaining 11(31.4%) had unilateral CTS (59 total wrists). Out of 59 wrists, 25(42.4%) had mild CTS whereas 34(57.6%) had moderate to severe CTS(p value-0.609). Of the 35 cases, 31(88.5%) reported worsening of CTS symptoms on using computer for long hours.

As per study done by Chin-Wei Liu et al[41], the incidence of CTS in the computer workers was 16.7% out of 45 subjects which is similar to the finding in our study.

Computer use involves constant use and movement of wrists and hands leading to dynamic pressure changes within the carpal tunnel. This leads to development of CTS.

4. MANUAL MILKING

In our study, out of 200 patients, 65 patients (32.5%) had a history of doing manual cow milking. Of the 65, 49(75.4%) cases had been doing cow milking for <2 hours a day and 16(24.6%) cases had been doing cow milking for more than 2 hours a day. The mean duration of daily hours of cow milking was 2.4 $\pm$ 0.9 hours/day. 53 cases(81.5%) out of 65 were in the age group of 30-60 years(p value- 0.581). The mean age of cases involved in cow milking in our study was 51.4 $\pm$ 10.5 years. Out of 65 cases, 57 were females and 8 were males(p value- 0.003). Female cow milkers were more common than male cow milkers. The female:male ratio was 7.12. Of the 65 cases, 52 cases(80%) had bilateral carpal tunnel syndrome and only 13 cases(20%) had unilateral carpal tunnel syndrome(p value- 0.034)(total 115 wrists). Of the 115 wrists, 43(36.8%) had mild CTS whereas 74(63.2%) had moderate to severe CTS(p value- 0.609).

As per study by Kouyoumdjian et al[42], in 3125 patients of carpal tunnel syndrome,43 cases were associated with cow milking. In this group of participants, mean age was 44.9 years and 88.4% were male. The mean time in the milking profession was 247 months and the mean daily milking time was 146 minutes. In study by Kutluhan et al[43] in 2009, 98 participants were taken. CTS was diagnosed by physical examination and electrophysiologic test in 41.25% cases and 37.5% of hands involved in cow milking. CTS frequency increased with age in cow milkers. Anuja Patil et al [44] conducted a study to determine the prevalence of carpal tunnel syndrome (CTS) among dairy workers. 66 dairy workers and 58 non-dairy workers were included in the study. They found the prevalence of CTS among the dairy parlor workers was

16.6%. In a study by Oktem et al [45], 35 cow milkers with CTS were studied. All of the cases were female and the mean age was 54.2 ±12.35years.As per Lima et al[46], incidence of CTS in cow milkers was 44.6% with 39.1% females and 5.4% males out of the 92 cases. This study showed high frequency of carpal tunnel syndrome among workers dealing with manual milking. In a study by Heba Allam et al [47], 240 participants were taken with 120 cases and 120 controls. The prevalence and clinical severity of CTS were significantly higher among female farmers who milked their cattle.

In our study, cow milking was strongly associated with CTS as compared to other modifiable risk factors as cow milking is a common household activity across various places in north india.

The findings in our study correlate with those in above mentioned studies with female preponderance and elderly age more commonly affected in cow milkers developing CTS. Female population of India are more commonly involved in household work and cow milking is their routine daily household work rather than a full fledged occupation. Thus, female cow milkers were more common than male cow milkers in this study. Cow milking activity requires active use of both hands. In thesecategory of patients, bilateral CTS involvement was more common than unilateral involvement. So, any female patient, especially from rural background, presenting with pain, numbness, paraesthesia in hands with history of cow milking should be assessed for possibility of CTS.

TRAUMATIC CARPAL TUNNEL SYNDROME

In our study, of 200 patients with carpal tunnel syndrome, 22 cases(11%) had a history of fracture of either arm or forearm. However, only 1 had a history of arm surgery in the past. Of the 22 cases with history of fracture, 9(40.9%) developed bilateral CTS whereas 11(59.1%) developed unilateral CTS (p value-0.003) signifying that fractures contribute to development of CTS on the affected side. In a study by H Aro et al(48), conservative management of 166 colles' fractures was associated with a 12% rate of late compression neuropathies(Median nerve>Ulnar nerve).According to

Abbott et al(71), CTS can develop as a late onset sequelae due to a wrist deformity caused by a carpal bone or radial fracture or other wrist traumas. In a study of 297 cases by Altissimi M et al[72], the incidence of CTS was 31% in patients following a Colles fracture.

Fractures of the arm and forearm lead to changes in anatomical structure affecting the carpal tunnel, thus causing CTS.

PRESENTING CLINICAL FEATURES

The most common presenting symptom in our study was numbness (93%) followed by pain in the hand on the affected side (79.5%) and tingling or paraesthesia (76%).Most common site of pain was thumb (78.5%) followed by index finger(63%) followed by forearm(17.5%). 75% cases reported nocturnal symptoms and confessed to disturbed sleep and nocturnal awakening due to these symptoms. Out of 186 patients presenting with numbness, 129(69.4%) had bilateral disease and 57(30.6%) had unilateral disease (total 315 wrists)(p value- 0.683). However, of the 315 wrists, 119(37.8%) had mild CTS while 196(62.2%) had moderate to severe CTS(p value-0.029). This indicates that numbness is associated with increased severity of disease and as the grade of disease increases, sensory symptoms of CTS become more apparent.

In study by Kendall et al [73] of 327 patients, 313 (95.7%) had paresthesia, 118 (38%) had nocturnal symptoms only, 178 (58%) had symptoms during the day and night, but worse at night.

In another study by Tay L B et al [63], paresthesia was present in 70.1% and numbness was present in 19.4% of the 134 patients.

However, numbness was a predominant presenting symptom (93%) in our study.

Due to lack of awareness and non-emergency nature of carpal tunnel syndrome, Indian population with CTS seek medical care when symptoms become worse or intolerable. So, patients presenting to tertiary care hospital for carpal tunnel syndrome usually present with severe symptoms like numbness and have moderate to severe disease.

CORRELATION OF CLINICAL TESTS WITH DIAGNOSIS OF CTS

In our study, patients were assessed clinically for presence of signs of CTS which include phalen test, tinel sign and durken test. The basic mechanism of these pressure provocative tests works on 'double crush hypothesis' which states that a compromised nerve already has a lower threshold to mechanical pressure as compared to an uncompromised nerve, so any additional pressure will cause symptoms of nerve compression readily when compared to the response of additional pressure on a normal nerve.

1.PHALEN TEST

In our study, phalen test was positive in 247 out of 340 CTS wrists(72.6%).

As per study by Bruske et al [60], sensitivity of phalen test was 85%.

In a study by LaJoie et al [61], sensitivity of phalen test was 92%.

In a study by Tay L B et al [63], phalen test was positive in 23.9% of the patients.As per Chaurasia et al [74], out of 195 hands of 100 patients which met the criteria of CTS, phalen test was positive in 53 right hands and 26 left hands i.e sensitivity of phalen test was 40.5%.

The sensitivity of phalen test in our study was 72.6% which is high.

Established sensitivity of phalen test has been different in various studies owing to the fact that phalen test has intraobserver bias and procedure of phalen test is complicated for patients to understand leading to further bias. Secondly, presence of phalen test is associated with increased severity of CTS. So, patients with mild CTS are less likely to have a positive phalen test and most patients in our study had moderate to severe CTS.

2. TINEL SIGN

In our study, tinel sign was positive in 35 out of 340 CTS wrists(10.3%).

As per study by Bruske et al [60], sensitivity of tinel sign was 67%.

In a study by LaJoie et al [61], sensitivity of tinel sign was 97%. In a study by Tay L B et al [63], tinel sign was positive in 33.6% of the patients. According to Kuschner et al [57], the sensitivity of tinel's sign ranges from 8% to 100% in CTS patients. In a study by Chaurasia et al [74], tinel's sign was positive in 25% cases.

However, contrary to above mentioned studies, the sensitivity of Tinel sign in our study was 10.3%.

Same findings were reported by Mondelli et al [75]. According to them, tinel sign is the least accurate test and combination of signs is not of more use than a single test alone.

3. DURKEN TEST

In our study, durken test was positive in 99 out of 340 CTS wrists (29.1%). However, out of 99 wrists, 24(24.2%) had mild CTS whereas 75 (75.8%) had moderate to severe CTS(p value-0.001). This indicates that positive durken test is associated with severe CTS and is a sensitive parameter of the severity.

In studies of diagnostic accuracy across the literature, the sensitivity of durkan's test ranged from 87% to 91% and its specificity from 90% to 95%.

The sensitivity and specificity of these tests vary with provocative nature of the test. As the examination manuouvre becomes more provocative, sensitivity and specifity of these tests get altered. Thus, resulting in variable sensitivity and specificity among various studies.

ETIOLOGY

1.DIABETES MELLITUS-

In our study, 69 cases(34.5%) were suffering from diabetes mellitus. 55(79.7%) cases had been diabetic for more than 5 years. 52 cases(75.4%) had bilateral CTS and remaining 17(24.6%) cases had unilateral cases(total 121 wrists). Out of 121 wrists, 73 (60.3%) had moderate to severe CTS. Most of the diabetic cases had uncontrolled blood sugar status (HBA1C>7). So, diabetic patients more commonly have bilateral and moderate to severe CTS.

In the study by Tay L B et al [63], they found that diabetes mellitus was present in 13.4% of 134 patients with CTS. In study by Subhabrata et al [76], carpal tunnel syndrome was present in 5% cases of diabetes. As per Pandey et al [77], Carpal tunnel syndrome was observed in 14% of 100 diabetes patients included in the study**.** As per Brown MJ et al[78], Carpal Tunnel Syndrome develops in 6% of all Type 2 diabetes sufferers. According to Dellon et al [79]**,** in diabetic patients, the median

nerve is already involved by a polyneuropathy, and is more easily subject to compression leading to increased incidence of carpal tunnel syndrome. As per Pourmemari et al [15], both Type 1 and Type 2 diabetes are risk factors for carpal tunnel syndrome. In a study by Becker et al [50], out of 791 CTS cases and 981 controls, female gender, BMI>30, age of 41-60 years and diabetes were significantly more frequent in the case group.

In our study, diabetes was a common association with CTS with most diabetics having bilateral, moderate-severe disease with an uncontrolled diabetic status.

2. HYPOTHYROIDISM-

In our study, Hypothyroidism was observed in 49(24.5%) cases. 43(87.8%) cases had been hypothyroid for >5 years and were on treatment for the same. 38 cases(77.6%) had bilateral CTS and remaining 11(22.4%) cases had unilateral cases(total 87 wrists). Of 87 wrists, 37 had mild CTS (42.5%) and 50 had moderate to severe CTS(57.5%).

In a study by Stevens JC et al [80], 5.2% of 1016 cases with CTS had hypothyroidism at the time of presentation. According to Golding DN et al [81], CTS can be the first sign of hypothyroidism. As per Fincham et al[82], the substitute medical therapy in hypothyroid patients will improve the clinical symptoms.

In our study, hypothyroidism was less commonly associated with CTS patients. However, CTS patients having hypothyroidism had a long history of thyroid disease with bilateral and moderate to severe form being more common.

3. RHEUMATOID ARTHRITIS-

In our study, there were 15 patients (7.5%) who were suffering from rheumatoid arthritis. Of the 27 wrists having rheumatoid arthritis, 70.4% had moderate to severe CTS.

In a study by Aluclu et al [83], they observed that out of 40 adult patients (totally 80 hands) with rheumatoid arthritis, carpal tunnel syndrome was determined in 20 hands (25%). They recommended that all rheumatoid arthritis patients should undergo nerve conduction studies as a routine

diagnostic procedure. In a study by Agarwal et al [84], carpal tunnel syndrome was seen in 11(10.1%) cases out of 180 cases of rheumatoid arthritis. As per meta-analysis by Shiri R et al(53), both rheumatoid arthritis and osteoarthritis were found to be associated with CTS and they concluded that both rheumatoid arthritis and osteoarthritis increase the risk of CTS.

4. PREGNANCY-

In our study, no pregnant patient presented to the facility. However, 40 females (26.8%) out of 149 included in the study had a history of pregnancy within 5 years of onset of CTS symptoms. Most of these had only mild to moderate CTS and bilateral involvement was much more common than unilateral involvement.

According to Bahrami et al [19], prevalence of CTS in pregnant women is significant. As per Breborowicz et al [55], CTS symptoms are quite common during pregnancy. They recommended early detection of CTS symptoms in pregnant women as it allows introduction of conservative treatment, which is successful in most cases.

OBSERVATION-

In our study, CTS was common in middle to elderly age group with female gender being more affected and was predominantly seen in overweight patients with BMI>25kg/m2. It was more common in non-skilled workers as compared to skilled workers and had a statistically significant association with driving and cow milking. Also in our study, traumatic CTS was mostly unilateral in nature. Diabetics and hypothyroid patients were found to develop bilateral and moderate to severe CTS in this study. The phalen test had a high sensitivity for CTS and positive durken test was a marker of severe disease.

LIMITATIONS-

1. Small sample size, single centered study.
2. Patients less than 18 years of age not included in the study.
3. History and clinical examination based study. Observer bias and recall bias may be present.

SUMMARY AND CONCLUSION

1. In India, CTS is relatively a disease of middle to eldery age group. The mean age of presentation was 49.73 ± 10.9 years.
2. There is a female preponderance in CTS. The female:male ratio of 2.9 was observed. This ratio was even more significant when cow milking was added as a risk factor.
3. CTS in more commonly seen in overweight patients with BMI>25kg/m2. As the weight increases, severity of cts also increases.
4. CTS was found to be more common in non skilled working group which included housewives, retired personnel, students etc.
5. Driving, computer use and cow milking were found to be an additional risk factor for bilateral CTS. Driving in particular was associated with moderate to severe form of CTS (p value- 0.029).
6. Female cow milkers were significantly higher in number than male cow milkers. Bilateral CTS was much more common than unilateral CTS in cow milkers group (p value-0.034).
7. Traumatic CTS is mostly unilateral in nature and is a commonly present on same side of injury (p value-0.003).
8. Most common presenting symptom of CTS was numbness (93%) followed by pain (79.5%) and paraesthesia (76%). Patients presenting with had more severe form of the disease (p value-0.029).
9. Phalen test had a high sensitivity (72.6%) whereas tinel sign and durken test had a low sensitivity (10.3% and 29.1% respectively). However, positive durken test was a marker of severe form of disease (p value- 0.001).
10. Systemic diseases like diabetes, hypothyroidism, rheumatoid arthritis are associated comorbid conditions of CTS and tend to cause bilateral and moderate to severe disease.

CONCLUSION-

CTS is an emerging disease in developing countries like the western world. Elderly age, female gender, high BMI are commonly associated risk factors for CTS. Driving, computer use and cow milking are additional risk factors for CTS. Systemic diseases like diabetes, hypothyroidism, rheumatoid arthritis also lead to CTS. Late presentation with moderate to severe grade was a common presentation among rural population due to their practice of cow milking and lack of awareness. Early recognition, control of risk factors and prompt treatment is the key to managing CTS. Hence, we conclude that people involved in cow milking should be counseled about possible complications including CTS and preventive mechanisms for the same. There is a need to develop alternative mechanical milking machines in order to prevent such complications. Alternatively, cow milkers should perform manual milking in shifts with regular breaks for hand relaxation in between the shifts.

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SERIAL NO.	MRD NO-	NAME	FATHER/ HUSBAND NAME	DATE OF VISIT	MONTH OF VISIT	AGE (YEARS)	GENDER (M/F)	WEIGHT (KG)	HEIGHT (CM)	BMI (KG/M2)	LIFESTYLE	OCCUPATION	DRIVING	DURATION (YEARS)	HOUR(S) /DAY	WRITING WORK	DURATION (YEARS)	HOUR(S) / DAY	COMPUTER USE	DURATION (YEARS)	HOUR(S) /DAY	COW MILKING	DURATION (YEARS)	TIME (HOUR(S) /DAY)	PAIN IN THUMB	PAIN IN INDEX FINGER
1	646498	P	SK	01-01-2019	JANUARY	31	F	73	152	31.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
2	613637	BK	SS	03-01-2019	JANUARY	62	F	68	157	27.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
3	211031	BK	MS	03-01-2019	JANUARY	46	F	66	160	25.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
4	647728	MK	HL	03-01-2019	JANUARY	54	F	75	163	28.2	MODERATE	HOUSEWIFE	YES,SCOOTY	5	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
5	620235	CK	TS	03-01-2019	JANUARY	50	F	75	152	32.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
6	582392	SK	SS	04-01-2019	JANUARY	60	F	60	157	24.3	MODERATE	RETIRED	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
7	647703	JS	RS	04-01-2019	JANUARY	34	M	84	165	30.9	MODERATE	SERVICE-ENGINEER	YES,CAR	10	2	YES	8	2	NO	-	-	NO	-	-	YES	YES
8	648698	NG	TG	05-01-2019	JANUARY	39	F	58	155	24.8	MODERATE	HOUSEWIFE	YES,SCOOTY	15	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
9	649692	NS	SS	07-01-2019	JANUARY	68	M	87	170	30.1	MODERATE	BUSINESS	YES,CAR	15	2	NO	-	-	NO	-	-	NO	-	-	YES	YES
10	649795	NS	IS	07-01-2019	JANUARY	50	F	70	160	27.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
11	650062	JK	GS	08-01-2019	JANUARY	38	F	70	152	31.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	5	1	YES	YES
12	649959	TS	SS	08-01-2019	JANUARY	42	M	75	175	23.7	MODERATE	AGRICULTURE	YES,TRACTOR	15	3	NO	-	-	NO	-	-	NO	-	-	NO	NO
13	650650	PK	GS	09-01-2019	JANUARY	33	F	72	157	29.2	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	5	3	YES	YES
14	651022	JK	PS	09-01-2019	JANUARY	45	F	66	157	26.8	MODERATE	HOUSEWIFE	YES,SCOOTY	10	2	NO	-	-	NO	-	-	NO	-	-	YES	YES
15	651030	PK	SS	09-01-2019	JANUARY	37	F	57	152	25.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
16	647610	JS	DS	10-01-2019	JANUARY	40	M	64	157	26	HEAVY	LABOURER	YES,TRACTOR	10	1	NO	-	-	NO	-	-	NO	-	-	NO	NO
17	601082	JK	HS	12-01-2019	JANUARY	54	F	80	155	22.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	2	YES	YES
18	4130	AP	HP	15-01-2019	JANUARY	44	F	70	155	29.1	MODERATE	HOUSEWIFE	YES,CAR	6	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
19	6665	RR	AS	15-01-2019	JANUARY	38	F	68	160	26.6	MODERATE	SERVICE-NURSE	YES,SCOOTY	10	2	YES	10	3	YES	10	2	NO	-	-	YES	YES
20	656212	MK	JS	19-01-2019	JANUARY	52	F	61	156	25.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	1	YES	YES
21	79585	SK	SS	21-01-2019	JANUARY	47	F	86	162	32.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	2	YES	YES
22	429048	AKJ	D	21-01-2019	JANUARY	54	M	76	170	26.3	MODERATE	SERVICE-BANKER	YES,CAR	15	0.5	YES	30	5	YES	10	5	NO	-	-	YES	YES
23	663559	RG	MR	01-02-2019	FEBRUARY	49	M	75	170	26	MODERATE	SHOPKEEPER	YES,BIKE	15	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
24	613213	JA	K	01-02-2019	FEBRUARY	45	M	50	167	17.9	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
25	629044	VJ	RJ	02-02-2019	FEBRUARY	68	F	60	157	24.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
26	663833	PK	PS	02-02-2019	FEBRUARY	36	F	70	160	27.3	MODERATE	SERVICE-TEACHER	NO	-	-	YES	8	5	NO	-	-	NO	-	-	YES	NO
27	665586	KK	GS	05-02-2019	FEBRUARY	45	F	61	154	25.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	7	3	YES	YES
28	665414	PK	HS	05-02-2019	FEBRUARY	41	F	65	155	27.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	6	2	YES	NO
29	665443	BS	BS	05-02-2019	FEBRUARY	68	M	74	172	25	MODERATE	SERVICE-ENGINEER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
30	666490	RK	BS	06-02-2019	FEBRUARY	65	F	65	157	26.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
31	541511	ZD	SD	07-02-2019	FEBRUARY	45	F	70	162	26.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
32	667509	NJ	SJ	08-02-2019	FEBRUARY	40	M	90	170	31.1	MODERATE	SERVICE-ADVOCATE	YES,CAR	10	2	YES	10	3	YES	10	3	NO	-	-	YES	YES
33	663474	MK	JS	08-02-2019	FEBRUARY	40	F	66	151	28.9	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	7	2	YES	YES
34	206823	SS	BS	08-02-2019	FEBRUARY	52	M	74	171	25.3	MODERATE	AGRICULTURE	NO	-	-	NO	-	-	NO	-	-	YES	20	3	YES	YES
35	668363	S	R	09-02-2019	FEBRUARY	42	F	72	154	30.4	MODERATE	HOUSEWIFE	YES,SCOOTY	10	2	NO	-	-	NO	-	-	NO	-	-	YES	NO
36	687450	R	S	13-03-2019	MARCH	44	F	65	152	28.1	MODERATE	SERVICE-CLERK	NO	-	-	YES	15	4	NO	15	2	NO	-	-	YES	YES
37	688544	S	BS	14-03-2019	MARCH	65	F	74	155	30.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	1	NO	NO
38	688586	KB	BMB	14-03-2019	MARCH	58	M	81	168	28.7	SEDENTARY	RETIRED	YES,SCOOTY	20	2	NO	-	-	NO	-	-	NO	-	-	NO	NO
39	691225	HK	AS	18-03-2019	MARCH	56	F	88	157	35.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	3	YES	YES
40	691945	JK	PS	19-03-2019	MARCH	53	F	111	162	42.3	MODERATE	HOUSEWIFE	YES,SCOOTY	10	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
41	692034	BB	RBM	19-03-2019	MARCH	39	F	80	157	32.5	MODERATE	SERVICE-TEACHER	NO	-	-	YES	5	2	YES	5	1	NO	-	-	YES	YES
42	570157	KK	SS	20-03-2019	MARCH	45	F	50	165	20.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	3	YES	YES
43	691525	SS	MS	20-03-2019	MARCH	44	M	60	165	22	MODERATE	DRIVER	YES,CAR	20	12	NO	-	-	NO	-	-	YES	9	2	YES	NO
44	475374	UR	VK	22-03-2019	MARCH	55	F	85	157	34.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	2	YES	YES
45	693618	SD	VP	22-03-2019	MARCH	60	F	50	142	22.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	3	YES	YES
46	692319	KS	PS	25-03-2019	MARCH	64	M	69	157	28	MODERATE	SERVICE-BANKER	YES,SCOOTY	20	2	YES	30	4	YES	10	3	NO	-	-	YES	NO
47	677397	KK	PS	25-03-2019	MARCH	42	F	88	156	36.2	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	3	YES	YES
48	695414	SS	DK	25-03-2019	MARCH	37	F	83	157	33.7	MODERATE	HOUSEWIFE	YES,SCOOTY	7	0.25	NO	-	-	NO	-	-	NO	-	-	NO	NO
49	558374	JK	RG	25-03-2019	MARCH	56	F	61	150	27.1	MODERATE	SERVICE-ACCOUNTANT	YES,SCOOTY	20	1	YES	15	2.5	YES	15	2.5	NO	-	-	YES	YES
50	622342	KS	BS	26-03-2019	MARCH	55	M	68	170	23.5	HEAVY	FARMER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
51	696029	VK	JS	26-03-2019	MARCH	33	F	60	157	24.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	6	3	YES	YES
52	695393	MR	DK	26-03-2019	MARCH	58	M	56	170	19.4	MODERATE	DRIVER	YES,CAR	30	6	NO	-	-	NO	-	-	NO	-	-	YES	NO
53	695832	KK	JS	26-03-2019	MARCH	50	F	64	152	27.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	0.5	NO	NO
54	696772	HK	IS	27-03-2019	MARCH	34	F	60	152	26	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	4	3	YES	YES
55	697425	KS	BS	28-03-2019	MARCH	64	M	83	165	30.5	MODERATE	BUSINESS	YES,SCOOTY	20	1	YES	20	1	NO	-	-	NO	-	-	YES	YES
56	118818	VM	RBM	30-03-2019	MARCH	61	M	90	168	31.9	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
57	698754	GB	GB	30-03-2019	MARCH	41	F	74	157	30	MODERATE	HOUSEWIFE	YES,SCOOTY	10	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
58	232463	SK	HS	30-03-2019	MARCH	58	F	78	156	32.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	3	YES	YES
59	699893	GK	BS	01-04-2019	APRIL	45	F	76	151	33.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	7	3	YES	YES

SERIAL NO.	MRD NO-	PAIN IN FOREARM	LEFT/ RIGHT	SYMPTOMS INCREASED BY DRIVING	SYMPTOMS INCREASED BY WRITING	SYMPTOMS INCREASED BY COMPUTER USE	PAIN AWAKENS AT NIGHT (YES/NO)	TINGLING (YES/NO)	NUMBNESS (YES/NO)	H/O TRAUMA(YES/NO)	H/O FRACTURE(YES/NO),DETAILS-	H/O ARM SURGERY(YES/NO),DETAILS-	CLINICAL SENSORY DEFICIT	CLINICAL MOTOR DEFICIT	PHALEN TEST(RIGHT)	PHALEN TEST(LEFT)	TINEL SIGN(RIGHT)
1	646498	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
2	613637	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
3	211031	YES	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
4	647728	YES	R	YES	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
5	620235	NO	L<R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
6	582392	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
7	647703	NO	L	YES	NO	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
8	648698	YES	L<R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
9	649692	NO	L=R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
10	649795	NO	R	N/A	N/A	N/A	NO	NO	YES	YES(RSA 15 YEARS AGO)	YES(RIGHT WRIST FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	POSITIVE
11	650062	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
12	649959	YES	R	NO	N/A	N/A	YES	NO	YES	NO	NO	YES,TENNIS ELBOW RIGHT(SURGERY IN 2014)	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
13	650650	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
14	651022	NO	L<R	YES	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
15	651030	NO	R	N/A	N/A	N/A	YES	YES	NO	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
16	647610	YES	L<R	NO	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
17	601082	NO	L=R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
18	4130	NO	L<R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
19	6665	NO	L<R	YES	NO	NO	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
20	656212	YES	L<R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
21	79585	YES	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
22	429048	NO	L	NO	NO	NO	YES	YES	YES	YES(LEFT HAND COMPRESSION INJURY)	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
23	663559	NO	L=R	NO	N/A	N/A	NO	YES	YES	NO	YES(RIGHT HUMERUS FRACTURE)	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
24	613213	NO	L>R	N/A	N/A	N/A	NO	YES	NO	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
25	629044	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
26	663833	NO	R	N/A	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
27	665586	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
28	665414	NO	L	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
29	665443	NO	R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
30	666490	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
31	541511	NO	L	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
32	667509	NO	L=R	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
33	663474	YES	L=R	N/A	N/A	N/A	YES	YES	NO	NO	YES(RIGHT RADIUS FRACTURE)	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
34	206823	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
35	668363	NO	R	YES	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	POSITIVE
36	687450	NO	L	N/A	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
37	688544	NO	L>>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
38	688586	NO	R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
39	691225	YES	L<R	N/A	N/A	N/A	YES	YES	NO	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
40	691945	NO	L=R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
41	692034	NO	R	N/A	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
42	570157	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
43	691525	NO	L	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
44	475374	NO	L=R	N/A	N/A	N/A	NO	YES	NO	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
45	693618	NO	L>>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
46	692319	NO	L<R	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
47	677397	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
48	695414	NO	L=R	NO	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
49	558374	NO	L<R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
50	622342	NO	L=R	N/A	N/A	N/A	YES	YES	NO	YES(LOCAL TRAUMA ON RIGHT HAND)	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
51	696029	NO	L	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
52	695393	NO	L=R	YES	N/A	N/A	NO	NO	NO	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
53	695832	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
54	696772	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
55	697425	NO	L=R	YES	YES	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
56	118818	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
57	698754	NO	R	YES	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
58	232463	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
59	699893	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE

SERIAL NO.	MRD NO-	TINEL SIGN(LEFT)	DURKEN TEST(RIGHT)	DURKEN TEST(LEFT)	H/O DIABETES	DURATION (YEARS)	RBS (MG/DL)-	HBA1C-	H/O HYPOTHYROIDISM	DURATION (YEARS)	TSH (UIU/ML)/ T3(PMOL/L)/ T4(PMOL/L)	H/O RHEUMATOID ARTHRITIS	DURATION (YEARS)	RA FACTOR (IU/ML)	ANTI CCP (U/ML)	H/O HYPOCORTISOLISM	DURATION (YEARS)	S.CORTISOL (NMOL/L)	LAST PREGNANCY DURATION (YEARS)	NCV FINDING (CTS)	CTS GRADE (LEFT)	CTS GRADE (RIGHT)
1	646498	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	1	B/L(L=R)	3	3
2	613637	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	215	8.1	YES	12	8.2/2.93/16	NO	-	-	-	NO	-	-	20	B/L(L=R)	2	2
3	211031	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	B/L(L>R)	3	2
4	647728	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	18	RIGHT	-	2
5	620235	NEGATIVE	NEGATIVE	POSITIVE	YES	3	185	6.5	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L<R)	2	3
6	582392	NEGATIVE	POSITIVE	POSITIVE	YES	5	212	9	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L=R)	3	3
7	647703	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	3	-
8	648698	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	B/L(L<R)	2	3
9	649692	NEGATIVE	POSITIVE	POSITIVE	YES	8	142	7.8	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
10	649795	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	15	RIGHT	-	4
11	650062	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	0.5	B/L(L<R)	3	4
12	649959	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	10.44/2.82/16.85	NO	-	-	-	NO	-	-	N/A	RIGHT	-	3
13	650650	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	1	B/L(L<R)	2	3
14	651022	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	8.22/5.1/13.24	NO	-	-	-	NO	-	-	8	B/L(L=R)	2	2
15	651030	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	1	RIGHT	-	2
16	647610	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
17	601082	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	14	B/L(L>R)	3	2
18	4130	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L<R)	3	4
19	6665	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	RIGHT	-	3
20	656212	NEGATIVE	NEGATIVE	NEGATIVE	YES	3	132	6.1	YES	0.5	16.77/0.77/3.90	NO	-	-	-	NO	-	-	20	B/L(L=R)	4	4
21	79585	POSITIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	6	B/L(L=R)	2	2
22	429048	POSITIVE	NEGATIVE	NEGATIVE	YES	5	186	7.2	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	2	-
23	663559	NEGATIVE	NEGATIVE	NEGATIVE	YES	8	130	9	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	3	2
24	613213	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L<R)	2	3
25	629044	NEGATIVE	NEGATIVE	NEGATIVE	YES	20	211	8.7	NO	-	-	NO	-	-	-	NO	-	-	28	RIGHT	-	3
26	663833	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	RIGHT	-	3
27	665586	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	16.44/1.69/10.86	NO	-	-	-	NO	-	-	10	B/L(L=R)	3	3
28	665414	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	YES	2	15.44/2.22/9.04	NO	-	-	-	NO	-	-	12	LEFT	2	-
29	665443	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	4
30	666490	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	30	B/L(L=R)	3	3
31	541511	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	15	LEFT	2	-
32	667509	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
33	663474	NEGATIVE	POSITIVE	POSITIVE	YES	2	156	6.2	NO	-	-	NO	-	-	-	NO	-	-	5	B/L(L=R)	2	2
34	206823	POSITIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
35	668363	NEGATIVE	NEGATIVE	NEGATIVE	YES	3	192	6.6	YES	5	16.44/5.21/5.16	NO	-	-	-	NO	-	-	10	RIGHT	-	2
36	687450	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L=R)	3	3
37	688544	NEGATIVE	NEGATIVE	POSITIVE	YES	5	356	9.1	NO	-	-	NO	-	-	-	NO	-	-	30	LEFT	3	-
38	688586	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	274	10.2	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	3
39	691225	NEGATIVE	POSITIVE	NEGATIVE	YES	7	156	9.9	NO	-	-	NO	-	-	-	NO	-	-	16	B/L(L<R)	3	4
40	691945	NEGATIVE	NEGATIVE	NEGATIVE	YES	7	213	9.3	YES	7	16.42/2.21/10.40	NO	-	-	-	NO	-	-	22	B/L(L=R)	3	3
41	692034	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	8	RIGHT	-	3
42	570157	NEGATIVE	NEGATIVE	NEGATIVE	YES	3	168	6.3	NO	-	-	NO	-	-	-	NO	-	-	13	RIGHT	-	3
43	691525	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	3	-
44	475374	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	8.81/1.89/11	NO	-	-	-	NO	-	-	15	B/L(L=R)	2	2
45	693618	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	30	LEFT	2	-
46	692319	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	211	6.8	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L<R)	2	3
47	677397	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	5	25	>500	NO	-	-	6	RIGHT	-	3
48	695414	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	B/L(L=R)	3	3
49	558374	NEGATIVE	NEGATIVE	POSITIVE	YES	5	250	8.1	NO	-	-	NO	-	-	-	NO	-	-	28	B/L(L<R)	3	5
50	622342	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	4	4
51	696029	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	1	LEFT	3	-
52	695393	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
53	695832	NEGATIVE	NEGATIVE	NEGATIVE	YES	5	163	8.1	YES	8	22/1.10/6.16	NO	-	-	-	NO	-	-	15	B/L(L=R)	3	3
54	696772	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	1	B/L(L=R)	3	3
55	697425	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
56	118818	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
57	698754	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	8.18/2.19/8.14	NO	-	-	-	NO	-	-	2	RIGHT	-	2
58	232463	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	YES	6	26	>500	NO	-	-	20	B/L(L=R)	3	3
59	699893	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	8	B/L(L>R)	3	2

SERIAL NO.	MRD NO-	NAME	FATHER/ HUSBAND NAME	DATE OF VISIT	MONTH OF VISIT	AGE (YEARS)	GENDER (M/F)	WEIGHT (KG)	HEIGHT (CM)	BMI (KG/M2)	LIFESTYLE	OCCUPATION	DRIVING	DURATION (YEARS)	HOUR(S) /DAY	WRITING WORK	DURATION (YEARS)	HOUR(S) / DAY	COMPUTER USE	DURATION (YEARS)	HOUR(S) /DAY	COW MILKING	DURATION (YEARS)	TIME (HOUR(S) /DAY)	PAIN IN THUMB	PAIN IN INDEX FINGER
60	699367	BP	GP	01-04-2019	APRIL	37	M	62	168	22	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
61	106283	VK	DK	02-04-2019	APRIL	50	F	73	162	27.8	MODERATE	SERVICE-TEACHER	NO	-	-	YES	20	4.5	NO	-	-	NO	-	-	NO	NO
62	33843	SG	DG	02-04-2019	APRIL	51	F	71	158	28.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
63	489778	BK	PSB	03-04-2019	APRIL	58	F	66	154	27.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	13	2	YES	YES
64	701401	SK	RA	03-04-2019	APRIL	36	F	68	154	28.7	MODERATE	SERVICE-ACCOUNTANT	YES,SCOOTY	5	1	YES	8	3	YES	8	3	NO	-	-	YES	YES
65	72328	DK	JS	04-04-2019	APRIL	65	F	77	160	29	MODERATE	SERVICE-TEACHER	NO	-	-	YES	30	3.5	YES	10	3	NO	-	-	YES	YES
66	698117	PK	DSB	05-04-2019	APRIL	32	F	81	157	32.9	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	3	YES	YES
67	702350	CS	PSB	05-04-2019	APRIL	65	M	71	173	23.7	MODERATE	AGRICULTURE	NO	-	-	NO	-	-	NO	-	-	YES	20	2.5	YES	YES
68	146698	P	DSB	06-04-2019	APRIL	46	M	81	159	32	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	14	2	YES	NO
69	71414	DK	KK	06-04-2019	APRIL	52	M	69	170	23.9	MODERATE	SERVICE-TEACHER	YES,SCOOTY	20	1	YES	20	2	YES	20	2	NO	-	-	YES	NO
70	704141	AKS	KS	06-04-2019	APRIL	61	M	86	173	28.6	MODERATE	RETIRED	YES,CAR	10	1	YES	25	1	YES	10	1	NO	-	-	YES	YES
71	131588	VD	JR	10-04-2019	APRIL	52	F	76	156	31.2	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	3	YES	YES
72	373882	NK	KS	10-04-2019	APRIL	56	F	66	159	26.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	2	YES	YES
73	706727	GS	PSB	11-04-2019	APRIL	43	M	86	170	29.8	MODERATE	SERVICE-BANKER	YES,CAR	12	1	YES	20	2	YES	10	4	NO	-	-	YES	YES
74	707923	RD	HCD	12-04-2019	APRIL	60	M	80	166	29	SEDENTARY	RETIRED	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
75	677758	KK	KS	12-04-2019	APRIL	42	F	89	156	36.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	8	2	YES	YES
76	707699	RN	RA	13-04-2019	APRIL	52	F	71	160	27.7	MODERATE	HOUSEWIFE	YES,SCOOTY	10	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
77	706283	MK	TSG	15-04-2019	APRIL	56	F	82	161	31.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	6	2	YES	YES
78	709069	VRG	RG	15-04-2019	APRIL	62	M	71	168	25.2	SEDENTARY	RETIRED	YES,CAR	7	2	NO	-	-	NO	-	-	NO	-	-	YES	YES
79	709227	VS	RS	15-04-2019	APRIL	55	M	88	166	31.9	MODERATE	BUSINESS	YES,CAR	20	1	NO	-	-	YES	10	1	NO	-	-	YES	YES
80	693381	JS	BS	16-04-2019	APRIL	41	M	65	170	22.5	MODERATE	SHOPKEEPER	YES,SCOOTY	30	0.25	NO	-	-	NO	-	-	NO	-	-	YES	YES
81	710060	MR	BS	20-04-2019	APRIL	57	F	66	152	28.6	MODERATE	SERVICE-TEACHER	YES,SCOOTY	25	2	YES	25	4.5	NO	-	-	NO	-	-	YES	YES
82	561471	MS	BS	20-04-2019	APRIL	50	F	70	152	30.3	MODERATE	SERVICE-ACCOUNTANT	YES,SCOOTY	15	1	YES	25	2	YES	10	2	NO	-	-	YES	YES
83	666367	KK	BL	22-04-2019	APRIL	75	F	84	150	37.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	30	2	YES	YES
84	713727	HK	PSB	22-04-2019	APRIL	46	F	72	158	28.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
85	713491	KS	BS	24-04-2019	APRIL	46	M	77	172	26	HEAVY	FARMER	NO	-	-	NO	-	-	NO	-	-	YES	20	2	YES	YES
86	706258	GK	RS	24-04-2019	APRIL	50	F	71	165	26.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	0.5	YES	YES
87	715003	PG	RG	24-04-2019	APRIL	47	F	75	162	28.6	MODERATE	SERVICE-CLERK	YES,SCOOTY	17	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
88	741024	KK	BS	25-04-2019	APRIL	58	F	65	155	27.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	2	YES	YES
89	174091	JK	BS	27-04-2019	APRIL	54	F	90	160	35.2	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
90	716928	SK	MS	27-04-2019	APRIL	43	F	69	161	26.6	MODERATE	SERVICE-ENGINEER	YES,SCOOTY	13	1	YES	17	3.5	NO	-	-	NO	-	-	YES	YES
91	713213	MS	GS	27-04-2019	APRIL	60	M	63	172	21.3	HEAVY	FARMER	NO	-	-	NO	-	-	NO	-	-	YES	20	2	YES	YES
92	715337	GK	RS	29-04-2019	APRIL	65	F	51	157	20.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
93	709280	KP	RPP	29-04-2019	APRIL	45	M	83	170	28.7	MODERATE	SHOPKEEPER	YES,CAR	10	1	NO	-	-	YES	10	2.5	NO	-	-	YES	YES
94	545144	AKM	RM	30-04-2019	APRIL	47	M	75	175	24.5	MODERATE	BUSINESS	YES,CAR	10	2	YES	20	0.5	YES	7	1	NO	-	-	YES	YES
95	718913	RN	KN	30-04-2019	APRIL	69	F	66	154	27.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
96	719657	AN	KN	01-05-2019	MAY	41	F	71	157	28.8	MODERATE	SERVICE-TEACHER	YES,SCOOTY	10	1	YES	15	3	NO	-	-	NO	-	-	NO	NO
97	347552	SKK	HOK	01-05-2019	MAY	65	F	71	166	25.8	MODERATE	SELF EMPLOYED	NO	-	-	NO	-	-	NO	-	-	YES	30	2	YES	NO
98	719641	JK	HSB	01-05-2019	MAY	65	F	84	153	35.9	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	2	NO	NO
99	720222	RK	BS	02-05-2019	MAY	58	F	64	152	27.7	MODERATE	SERVICE-TEACHER	YES,SCOOTY	20	2	YES	25	4	YES	5	2	NO	-	-	YES	YES
100	354786	PK	GS	04-05-2019	MAY	36	F	77	160	30.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
101	52889	MR	BK	04-05-2019	MAY	67	F	58	150	25.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	1	YES	YES
102	143039	KK	AS	06-05-2019	MAY	34	F	69	158	27.6	MODERATE	HOUSEWIFE	YES,SCOOTY	5	1	NO	-	-	NO	-	-	NO	-	-	NO	NO
103	711942	AV	RV	07-05-2019	MAY	52	F	74	162	28.2	MODERATE	SERVICE-ACCOUNTANT	YES,SCOOTY	15	2	YES	20	4	YES	10	4	NO	-	-	YES	YES
104	709787	RK	AS	07-05-2019	MAY	35	F	82	163	30.9	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
105	718747	AK	HSB	07-05-2019	MAY	46	F	86	168	30.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
106	724792	BK	DS	09-05-2019	MAY	38	F	68	161	26.2	MODERATE	SERVICE-NURSE	NO	-	-	YES	15	2	YES	5	3	NO	-	-	NO	NO
107	116432	DK	SS	13-05-2019	MAY	48	F	91	158	36.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	2	NO	NO
108	727375	MS	PS	13-05-2019	MAY	50	M	66	170	22.8	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
109	728595	AK	BS	14-05-2019	MAY	51	F	78	156	32.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
110	724779	BK	HLS	14-05-2019	MAY	58	F	73	165	26.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	2	YES	YES
111	728985	JK	AS	15-05-2019	MAY	40	F	68	160	26.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	3	NO	NO
112	623019	SD	VD	15-05-2019	MAY	56	F	88	157	35.7	MODERATE	SERVICE-TEACHER	YES,CAR	5	1	YES	20	3	NO	-	-	NO	-	-	NO	NO
113	729956	GS	JS	16-05-2019	MAY	30	M	86	170	29.8	MODERATE	SHOPKEEPER	YES,SCOOTY	5	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
114	696099	SS	FS	16-05-2019	MAY	53	M	63	172	21.3	MODERATE	SERVICE-ENGINEER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
115	478845	PK	GS	17-05-2019	MAY	67	F	81	158	32.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	40	1	YES	YES
116	730179	AG	SG	17-05-2019	MAY	58	F	69	153	29.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
117	49595	HS	JS	18-05-2019	MAY	70	M	83	175	27.1	MODERATE	DRIVER	YES,CAR	20	2	NO	-	-	NO	-	-	NO	-	-	YES	YES
118	729663	AK	BS	18-05-2019	MAY	49	M	71	165	26.1	MODERATE	SERVICE-ACCOUNTANT	YES,SCOOTY	20	2	YES	25	3	YES	3	1	NO	-	-	NO	NO

SERIAL NO.	MRD NO-	PAIN IN FOREARM	LEFT/ RIGHT	SYMPTOMS INCREASED BY DRIVING	SYMPTOMS INCREASED BY WRITING	SYMPTOMS INCREASED BY COMPUTER USE	PAIN AWAKENS AT NIGHT (YES/NO)	TINGLING (YES/NO)	NUMBNESS (YES/NO)	H/O TRAUMA(YES/NO)	H/O FRACTURE(YES/NO),DETAILS-	H/O ARM SURGERY(YES/NO),DETAILS-	CLINICAL SENSORY DEFICIT	CLINICAL MOTOR DEFICIT	PHALEN TEST(RIGHT)	PHALEN TEST(LEFT)	TINEL SIGN(RIGHT)
60	699367	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	YES(B/L RADIUS FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
61	106283	NO	L<R	N/A	YES	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
62	33843	NO	L=R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
63	489778	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
64	701401	NO	L=R	YES	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
65	72328	NO	L>R	N/A	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
66	698117	NO	L=R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
67	702350	NO	L>>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
68	146698	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
69	71414	NO	R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
70	704141	YES	L=R	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
71	131588	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
72	373882	NO	R	N/A	N/A	N/A	NO	NO	YES	YES(RSA 20 YEARS AGO)	YES(RIGHT RADIUS FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	POSITIVE
73	706727	NO	L>R	NO	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
74	707923	NO	L=R	N/A	N/A	N/A	NO	NO	YES	YES(BLUNT TRAUMA RIGHT ARM)	YES(RIGHT WRIST FRACTURE)	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
75	677758	YES	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
76	707699	NO	L=R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
77	706283	NO	L<R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
78	709069	NO	L	YES	N/A	N/A	YES	YES	YES	YES(BLUNT TRAUMA LEFT ARM)	YES(LEFT DISTAL RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
79	709227	NO	L=R	YES	N/A	NO	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
80	693381	NO	L=R	NO	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
81	710060	NO	L<R	YES	YES	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
82	561471	NO	L<R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
83	666367	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
84	713727	NO	L<R	N/A	N/A	N/A	YES	YES	YES	YES(H/O FALL ON OUTSTRETCHED HAND)	YES(L SCAPHOID & R RADIUS FRACTURE)	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
85	713491	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
86	706258	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
87	715003	NO	L>R	YES	N/A	N/A	YES	YES	NO	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
88	741024	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	POSITIVE
89	174091	NO	L	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
90	716928	NO	R	YES	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
91	713213	NO	L<R	N/A	N/A	N/A	YES	YES	YES	YES(RSA 20 YEARS AGO)	YES(B/L BOTH BONE FOREARM FRACTURE)	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
92	715337	NO	R	N/A	N/A	N/A	NO	YES	YES	YES(FALL ON OUTSTRETCHED HAND)	YES(RIGHT DISTAL RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	NEGATIVE	POSITIVE
93	709280	NO	L>R	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
94	545144	NO	R	YES	NO	NO	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
95	718913	NO	L>R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
96	719657	NO	R	YES	YES	N/A	NO	NO	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
97	347552	NO	L=R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
98	719641	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
99	720222	YES	L<R	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
100	354786	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
101	52889	NO	L=R	N/A	N/A	N/A	NO	YES	NO	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
102	143039	NO	L<R	NO	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
103	711942	NO	L<R	YES	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	POSITIVE
104	709787	NO	L=R	N/A	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
105	718747	NO	L<R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
106	724792	NO	R	N/A	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
107	116432	NO	L=R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
108	727375	YES	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
109	728595	NO	R	N/A	N/A	N/A	YES	NO	YES	YES(FALL ON RIGHT OUTSTRETCHED HAND)	YES(RIGHT DISTAL RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	NEGATIVE	POSITIVE
110	724779	YES	L<R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
111	728985	NO	L=R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
112	623019	NO	L>R	YES	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
113	729956	NO	R	YES	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
114	696099	YES	R	N/A	N/A	N/A	NO	NO	NO	YES(RSA 5 YEARS AGO)	YES(RIGHT RADIUS AND ULNA FRACTURE)	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
115	478845	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
116	730179	NO	L<R	N/A	N/A	N/A	NO	YES	YES	YES(RSA 4 YEARS AGO)	YES(RIGHT DISTAL RADIUS FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
117	49595	NO	L<R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
118	729663	NO	L=R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE

SERIAL NO.	MRD NO-	TINEL SIGN(LEFT)	DURKEN TEST(RIGHT)	DURKEN TEST(LEFT)	H/O DIABETES	DURATION (YEARS)	RBS (MG/DL)-	HBA1C-	H/O HYPOTHYROIDISM	DURATION (YEARS)	TSH (UIU/ML)/ T3(PMOL/L)/ T4(PMOL/L)	H/O RHEUMATOID ARTHRITIS	DURATION (YEARS)	RA FACTOR (IU/ML)	ANTI CCP (U/ML)	H/O HYPOCORTISOLISM	DURATION (YEARS)	S.CORTISOL (NMOL/L)	LAST PREGNANCY DURATION (YEARS)	NCV FINDING (CTS)	CTS GRADE (LEFT)	CTS GRADE (RIGHT)
60	699367	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	4
61	106283	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	10.66/1.10/12.01	NO	-	-	-	NO	-	-	12	B/L(L=R)	2	2
62	33843	NEGATIVE	POSITIVE	POSITIVE	YES	20	296	9.9	NO	-	-	NO	-	-	-	NO	-	-	16	B/L(L=R)	4	4
63	489778	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	8	52	122	NO	-	-	24	B/L(L<R)	2	3
64	701401	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	2	B/L(L=R)	3	3
65	72328	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	YES	10	13.44/9.6/1.12	NO	-	-	-	NO	-	-	34	B/L(L>R)	4	2
66	698117	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	B/L(L=R)	3	3
67	702350	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	217	9.1	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	3	-
68	146698	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	8	RIGHT	-	4
69	71414	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	314	10.1	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	3
70	704141	NEGATIVE	NEGATIVE	NEGATIVE	YES	13	312	10.2	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
71	131588	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	10	RIGHT	-	2
72	373882	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	13/2.14/6.11	NO	-	-	-	NO	-	-	15	RIGHT	-	2
73	706727	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
74	707923	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
75	677758	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	3	22/1.12/9.2	NO	-	-	-	NO	-	-	4	B/L(L=R)	3	3
76	707699	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	10	56	491	NO	-	-	17	B/L(L=R)	1	1
77	706283	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	0.5	24/1.24/6.01	NO	-	-	-	NO	-	-	16	B/L(L=R)	3	3
78	709069	NEGATIVE	NEGATIVE	POSITIVE	YES	3	256	7.7	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	2	-
79	709227	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	1	1
80	693381	NEGATIVE	NEGATIVE	NEGATIVE	YES	2	220	7.1	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
81	710060	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	10.12/1.12/4.41	NO	-	-	-	NO	-	-	33	B/L(L<R)	3	4
82	561471	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	20	B/L(L<R)	3	4
83	666367	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	YES	10	14/2.14/10	NO	-	-	-	NO	-	-	40	B/L(L<R)	3	4
84	713727	NEGATIVE	NEGATIVE	NEGATIVE	YES	5	312	9.6	NO	-	-	NO	-	-	-	NO	-	-	6	B/L(L<R)	3	4
85	713491	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	3	2
86	706258	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	15	55	>500	NO	-	-	10	RIGHT	-	3
87	715003	NEGATIVE	NEGATIVE	NEGATIVE	YES	7	259	7.1	NO	-	-	NO	-	-	-	NO	-	-	13	B/L(L>R)	3	2
88	741024	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	YES	10	21.46/1.22/13.14	NO	-	-	-	NO	-	-	24	RIGHT	-	3
89	174091	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	317	10.4	YES	10	16.76/1.24/7.29	NO	-	-	-	NO	-	-	18	LEFT	2	-
90	716928	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	10	75	>500	NO	-	-	7	RIGHT	-	3
91	713213	POSITIVE	NEGATIVE	NEGATIVE	YES	7	286	8.1	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L<R)	2	3
92	715337	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	30	RIGHT	-	4
93	709280	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	4	2
94	545144	NEGATIVE	NEGATIVE	NEGATIVE	YES	6	264	8.3	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	2
95	718913	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	15	34	>500	NO	-	-	40	B/L(L>R)	3	2
96	719657	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	6	RIGHT	-	2
97	347552	NEGATIVE	POSITIVE	POSITIVE	YES	15	256	8.3	NO	-	-	NO	-	-	-	NO	-	-	25	B/L(L=R)	3	3
98	719641	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	25	B/L(L>R)	3	2
99	720222	NEGATIVE	NEGATIVE	NEGATIVE	YES	14	198	7.6	NO	-	-	NO	-	-	-	NO	-	-	24	B/L(L=R)	2	2
100	354786	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	12.42/2.14/6.48	NO	-	-	-	NO	-	-	2	B/L(L=R)	3	3
101	52889	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	30	B/L(L=R)	1	1
102	143039	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	7	16/4.04/3.11	NO	-	-	-	NO	-	-	1	B/L(L=R)	2	2
103	711942	NEGATIVE	POSITIVE	POSITIVE	YES	20	216	6.9	YES	10	25.46/1.81/10.41	NO	-	-	-	NO	-	-	20	B/L(L<R)	2	3
104	709787	POSITIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	6	24	>500	NO	-	-	1	B/L(L=R)	3	3
105	718747	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	YES	15	28	>500	NO	-	-	16	B/L(L=R)	3	3
106	724792	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	8	10.42/2.81/13.46	NO	-	-	-	NO	-	-	6	RIGHT	-	1
107	116432	NEGATIVE	POSITIVE	POSITIVE	YES	2	236	8	NO	-	-	NO	-	-	-	NO	-	-	14	B/L(L=R)	4	4
108	727375	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
109	728595	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	20	RIGHT	-	3
110	724779	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	246	9.8	YES	5	21.28/3.1/13.64	NO	-	-	-	NO	-	-	27	B/L(L=R)	4	4
111	728985	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	YES	6	32	>500	NO	-	-	8	B/L(L=R)	3	3
112	623019	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	16	B/L(L>R)	3	2
113	729956	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	1
114	696099	NEGATIVE	NEGATIVE	NEGATIVE	YES	7	198	6.6	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	2
115	478845	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	YES	10	32.14/0.56/8.42	NO	-	-	-	NO	-	-	30	B/L(L=R)	4	4
116	730179	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	16	B/L(L<R)	2	5
117	49595	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L<R)	3	5
118	729663	NEGATIVE	NEGATIVE	NEGATIVE	YES	6	296	9.7	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2

SERIAL NO.	MRD NO-	NAME	FATHER/ HUSBAND NAME	DATE OF VISIT	MONTH OF VISIT	AGE (YEARS)	GENDER (M/F)	WEIGHT (KG)	HEIGHT (CM)	BMI (KG/M2)	LIFESTYLE	OCCUPATION	DRIVING	DURATION (YEARS)	HOUR(S) /DAY	WRITING WORK	DURATION (YEARS)	HOUR(S) / DAY	COMPUTER USE	DURATION (YEARS)	HOUR(S) /DAY	COW MILKING	DURATION (YEARS)	TIME (HOUR(S) /DAY)	PAIN IN THUMB	PAIN IN INDEX FINGER
119	731263	KL	KC	18-05-2019	MAY	68	M	79	168	28	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
120	731805	PK	DS	20-05-2019	MAY	49	F	88	155	36.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	16	2	YES	YES
121	731697	AK	CK	20-05-2019	MAY	52	M	68	160	26.6	MODERATE	BUSINESS	YES,SCOOTY	29	1	NO	-	-	NO	-	-	NO	-	-	NO	NO
122	719381	PK	NS	21-05-2019	MAY	50	F	71	152	30.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	1	NO	NO
123	334863	S	PK	21-05-2019	MAY	45	F	62	150	27.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	2	NO	NO
124	724393	SKK	HSB	23-05-2019	MAY	60	F	80	168	28.3	MODERATE	SERVICE-TEACHER	YES,SCOOTY	20	1	YES	30	4	NO	-	-	NO	-	-	YES	YES
125	455402	CM	AM	24-05-2019	MAY	57	F	75	155	31.2	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
126	741942	JK	KS	04-06-2019	JUNE	44	F	65	151	28.5	MODERATE	SERVICE-TEACHER	YES,SCOOTY	15	1	YES	17	4	NO	-	-	NO	-	-	YES	YES
127	742577	RG	PG	05-06-2019	JUNE	38	F	88	170	30.4	MODERATE	BUSINESS	YES,CAR	10	2	YES	10	1	YES	10	3	NO	-	-	YES	NO
128	743131	RS	VS	06-06-2019	JUNE	57	F	88	153	36.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
129	667079	DK	HS	08-06-2019	JUNE	47	F	68	151	29.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	24	2	YES	YES
130	745287	KK	AS	10-06-2019	JUNE	19	F	78	148	35.6	MODERATE	STUDENT	NO	-	-	YES	5	4	YES	3	2	NO	-	-	YES	NO
131	252767	DR	CL	11-06-2019	JUNE	68	F	68	155	28.3	MODERATE	SERVICE-TEACHER	YES,SCOOTY	20	1	YES	35	4	YES	8	3	NO	-	-	YES	YES
132	318975	JK	SS	11-06-2019	JUNE	48	F	71	153	30.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	16	2	YES	NO
133	748649	RK	VS	15-06-2019	JUNE	36	F	80	160	31.2	MODERATE	SERVICE-BANKER	YES,SCOOTY	10	2	YES	15	3	YES	10	3	NO	-	-	NO	NO
134	750798	PV	RV	19-06-2019	JUNE	42	F	64	150	28.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	6	1	YES	YES
135	746133	GK	MS	21-06-2019	JUNE	52	F	83	161	32	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	1	YES	YES
136	752276	JJ	AJ	21-06-2019	JUNE	53	F	66	159	26.1	MODERATE	HOUSEWIFE	YES,SCOOTY	15	2	NO	-	-	NO	-	-	NO	-	-	YES	NO
137	127342	B	RRV	22-06-2019	JUNE	51	F	70	164	26	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	2	NO	NO
138	753441	RK	KC	22-06-2019	JUNE	61	F	89	158	35.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	30	1	YES	YES
139	743732	BK	DS	28-06-2019	JUNE	38	F	70	165	25.7	MODERATE	SERVICE-ENGINEER	YES,CAR	8	1	YES	12	4	NO	-	-	NO	-	-	NO	NO
140	757551	KK	PS	29-06-2019	JUNE	47	F	69	163	26	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	3	YES	YES
141	759600	AK	PS	02-07-2019	JULY	33	F	76	162	29	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
142	761653	MK	RS	05-07-2019	JULY	57	F	74	156	30.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	1	NO	NO
143	612150	HK	DS	06-07-2019	JULY	55	F	69	153	29.5	MODERATE	SERVICE-TEACHER	YES,SCOOTY	30	2	YES	30	4	NO	-	-	NO	-	-	YES	YES
144	763144	SK	HG	08-07-2019	JULY	39	F	81	165	29.8	MODERATE	HOUSEWIFE	YES,SCOOTY	5	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
145	721611	SK	RS	09-07-2019	JULY	59	F	66	152	28.6	MODERATE	SERVICE-BANKER	YES,SCOOTY	10	2	YES	15	3	YES	5	2	NO	-	-	NO	NO
146	764339	CK	KS	10-07-2019	JULY	34	F	88	151	38.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	5	2	YES	YES
147	757064	DR	KL	12-07-2019	JULY	63	F	72	155	30	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
148	765720	MK	SS	12-07-2019	JULY	36	F	65	158	26	MODERATE	SERVICE-NURSE	YES,SCOOTY	6	1	YES	10	4	NO	-	-	NO	-	-	YES	NO
149	776442	SD	BL	13-07-2019	JULY	73	M	73	169	25.6	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	YES	40	2	YES	YES
150	767723	B	KP	15-07-2019	JULY	39	F	80	154	33.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	1	YES	NO
151	77625	SA	SA	07-08-2019	AUGUST	59	F	76	161	29.3	MODERATE	SERVICE-TEACHER	YES,CAR	10	1	YES	30	4	NO	-	-	NO	-	-	YES	YES
152	491776	RC	RS	08-08-2019	AUGUST	55	M	69	171	23.6	MODERATE	DRIVER	YES,CAR	20	6	NO	-	-	NO	-	-	NO	-	-	NO	NO
153	786823	JS	KS	13-08-2019	AUGUST	52	M	78	168	27.6	MODERATE	SERVICE-ENGINEER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
154	388488	SK	MB	13-08-2019	AUGUST	36	F	68	163	25.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	10	2	YES	YES
155	788520	R	SK	16-08-2019	AUGUST	38	F	87	160	34	MODERATE	HOUSEWIFE	YES,SCOOTY	10	1	NO	-	-	NO	-	-	NO	-	-	NO	NO
156	789937	RK	GS	17-08-2019	AUGUST	38	F	64	154	27	MODERATE	SERVICE-NURSE	NO	-	-	YES	12	3	YES	12	2	NO	-	-	YES	NO
157	793972	KK	JS	23-08-2019	AUGUST	57	F	71	154	29.9	MODERATE	SERVICE-BANKER	YES,SCOOTY	20	1	YES	30	4	YES	10	2	NO	-	-	YES	YES
158	776008	LK	PS	24-08-2019	AUGUST	52	F	78	164	29	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	30	2	YES	YES
159	351793	V	RK	27-08-2019	AUGUST	56	M	81	174	26.8	MODERATE	SHOPKEEPER	YES,CAR	20	1	NO	-	-	NO	-	-	NO	-	-	YES	NO
160	795787	JK	PS	28-08-2019	AUGUST	57	F	69	160	27	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
161	207373	RK	TS	13-09-2019	SEPTEMBER	67	F	81	160	31.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	29	2	NO	NO
162	100511	S	MG	14-09-2019	SEPTEMBER	40	F	88	158	35.3	MODERATE	SERVICE-TEACHER	YES,SCOOTY	15	1	YES	15	4	YES	5	2	NO	-	-	YES	NO
163	579186	MK	HS	17-09-2019	SEPTEMBER	59	F	74	156	30.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	20	1	NO	NO
164	775221	PK	BK	20-09-2019	SEPTEMBER	56	M	72	168	25.5	HEAVY	CARPENTER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
165	814744	AG	SG	21-09-2019	SEPTEMBER	48	F	88	160	34.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO
166	242147	DS	JS	23-09-2019	SEPTEMBER	62	M	71	169	24.9	MODERATE	SHOPKEEPER	YES,CAR	15	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
167	815591	NK	KS	23-09-2019	SEPTEMBER	39	F	86	159	34	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
168	785396	NK	BSS	24-09-2019	SEPTEMBER	38	F	78	157	31.6	MODERATE	SERVICE-BANKER	YES,SCOOTY	10	1	YES	10	3	YES	10	3	NO	-	-	YES	NO
169	550956	JK	KS	25-09-2019	SEPTEMBER	51	F	66	158	26.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
170	818028	GK	AS	26-09-2019	SEPTEMBER	38	F	75	160	29.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
171	827740	GK	PS	11-10-2019	OCTOBER	52	F	75	160	29.3	MODERATE	SERVICE-TEACHER	YES,SCOOTY	30	1	YES	30	4	YES	10	1	NO	-	-	YES	YES
172	827896	G	BR	12-10-2019	OCTOBER	30	M	68	172	23	MODERATE	SERVICE-ELECTRICIAN	YES,SCOOTY	5	4	NO	-	-	NO	-	-	NO	-	-	YES	YES
173	830403	KK	JS	15-10-2019	OCTOBER	67	M	88	170	30.4	SEDENTARY	RETIRED	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
174	830742	JP	RP	16-10-2019	OCTOBER	59	M	68	164	25.3	MODERATE	SHOPKEEPER	YES,SCOOTY	30	1	NO	-	-	NO	-	-	NO	-	-	NO	NO
175	830838	SR	RK	16-10-2019	OCTOBER	46	F	81	165	29.8	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	15	2	YES	YES
176	831556	TK	HS	17-10-2019	OCTOBER	49	F	94	167	33.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
177	639736	RKT	KS	18-10-2019	OCTOBER	35	F	69	161	26.6	MODERATE	SERVICE-ACCOUNTANT	YES,SCOOTY	10	1	YES	8	4	YES	8	4	NO	-	-	YES	NO

SERIAL NO.	MRD NO-	PAIN IN FOREARM	LEFT/ RIGHT	SYMPTOMS INCREASED BY DRIVING	SYMPTOMS INCREASED BY WRITING	SYMPTOMS INCREASED BY COMPUTER USE	PAIN AWAKENS AT NIGHT (YES/NO)	TINGLING (YES/NO)	NUMBNESS (YES/NO)	H/O TRAUMA(YES/NO)	H/O FRACTURE(YES/NO),DETAILS-	H/O ARM SURGERY(YES/NO),DETAILS-	CLINICAL SENSORY DEFICIT	CLINICAL MOTOR DEFICIT	PHALEN TEST(RIGHT)	PHALEN TEST(LEFT)	TINEL SIGN(RIGHT)
119	731263	YES	L>R	N/A	N/A	N/A	YES	NO	YES	YES(FALL ON LEFT OUTSTRETCHED HAND)	YES(LEFT RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
120	731805	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
121	731697	NO	L>R	YES	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
122	719381	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
123	334863	NO	L=R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
124	724393	NO	L=R	NO	YES	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
125	455402	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
126	741942	NO	L<<R	YES	YES	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
127	742577	NO	L>R	YES	NO	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
128	743131	NO	L>R	N/A	N/A	N/A	YES	NO	YES	YES(RSA 8 YEARS AGO)	YES(LEFT DISTAL RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
129	667079	YES	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
130	745287	NO	L=R	N/A	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
131	252767	YES	L	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
132	318975	NO	L<R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
133	748649	NO	R	YES	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	POSITIVE
134	750798	YES	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
135	746133	NO	L=R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
136	752276	NO	L>R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
137	127342	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
138	753441	YES	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
139	743732	NO	R	YES	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
140	757551	YES	L=R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
141	759600	NO	R	N/A	N/A	N/A	YES	YES	YES	YES(H/O FALL ON OUTSTRETCHED HAND)	YES(RIGHT RADIUS FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	POSITIVE
142	761653	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
143	612150	YES	L<<R	YES	YES	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
144	763144	NO	R	YES	N/A	N/A	NO	NO	YES	YES(RSA 6 YEARS AGO)	YES(RIGHT SCAPHOID FRACTURE)	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
145	721611	NO	R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
146	764339	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
147	757064	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
148	765720	NO	R	YES	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
149	776442	YES	L<R	N/A	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
150	767723	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
151	77625	NO	L>>R	YES	YES	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
152	491776	NO	L>>R	YES	N/A	N/A	YES	YES	YES	YES(H/O RSA 15 YEARS AGO)	YES(LEFT DISTAL RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
153	786823	YES	L>>R	N/A	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
154	388488	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
155	788520	NO	L<<R	YES	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
156	789937	NO	L<R	N/A	YES	YES	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
157	793972	YES	L=R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
158	776008	NO	L>R	N/A	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
159	351793	NO	L>>R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
160	795787	NO	R	N/A	N/A	N/A	NO	YES	YES	YES(H/O RSA 12 YEARS AGO)	YES(RIGHT DISTAL RADIUS FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
161	207373	NO	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
162	100511	NO	L<R	YES	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
163	579186	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
164	775221	YES	L=R	N/A	N/A	N/A	NO	NO	YES	YES(OCCUPATIONAL ACCIDENT 15 YEARS AGO)	ES(RIGHT BOTH BONE FOREARM FRACTUR	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
165	814744	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
166	242147	NO	L<R	YES	N/A	N/A	YES	NO	NO	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
167	815591	YES	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
168	785396	NO	L=R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
169	550956	NO	L=R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
170	818028	YES	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
171	827740	NO	R	YES	YES	YES	YES	NO	NO	YES(H/O RSA 10 YEARS AGO)	YES(RIGHT DISTAL RADIUS FRACTURE)	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
172	827896	YES	R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	POSITIVE
173	830403	NO	L>R	N/A	N/A	N/A	YES	YES	YES	YES(H/O FALL 7 MONTHS BACK)	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
174	830742	NO	L<R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
175	830838	YES	L<R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
176	831556	YES	L=R	N/A	N/A	N/A	NO	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
177	639736	NO	L<R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE

SERIAL NO.	MRD NO-	TINEL SIGN(LEFT)	DURKEN TEST(RIGHT)	DURKEN TEST(LEFT)	H/O DIABETES	DURATION (YEARS)	RBS (MG/DL)-	HBA1C-	H/O HYPOTHYROIDISM	DURATION (YEARS)	TSH (UIU/ML)/ T3(PMOL/L)/ T4(PMOL/L)	H/O RHEUMATOID ARTHRITIS	DURATION (YEARS)	RA FACTOR (IU/ML)	ANTI CCP (U/ML)	H/O HYPOCORTISOLISM	DURATION (YEARS)	S.CORTISOL (NMOL/L)	LAST PREGNANCY DURATION (YEARS)	NCV FINDING (CTS)	CTS GRADE (LEFT)	CTS GRADE (RIGHT)
119	731263	NEGATIVE	NEGATIVE	NEGATIVE	YES	20	266	7.8	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	4	2
120	731805	NEGATIVE	NEGATIVE	NEGATIVE	YES	17	239	8.1	YES	20	29.08/1.41/11.26	NO	-	-	-	NO	-	-	15	B/L(L=R)	5	5
121	731697	NEGATIVE	POSITIVE	POSITIVE	YES	20	208	7.2	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	4	3
122	719381	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	20	32	>500	NO	-	-	16	B/L(L=R)	3	3
123	334863	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	8	B/L(L=R)	2	2
124	724393	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	YES	5	13.86/2.81/14.46	NO	-	-	-	NO	-	-	17	B/L(L=R)	3	3
125	455402	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	191	7.2	NO	-	-	NO	-	-	-	NO	-	-	17	B/L(L=R)	2	2
126	741942	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	YES	8	12.68/2.41/17.96	NO	-	-	-	NO	-	-	4	RIGHT	-	3
127	742577	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	NO	-	-	YES	6	24	84	NO	-	-	3	B/L(L=R)	3	3
128	743131	POSITIVE	NEGATIVE	NEGATIVE	YES	15	278	9.8	YES	10	12.88/5.85/17.79	NO	-	-	-	NO	-	-	24	B/L(L>R)	4	2
129	667079	NEGATIVE	POSITIVE	POSITIVE	YES	5	181	7.2	NO	-	-	NO	-	-	-	NO	-	-	14	B/L(L<R)	4	5
130	745287	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
131	252767	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	16.86/6.10/11.41	NO	-	-	-	NO	-	-	32	LEFT	2	-
132	318975	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	229	9.2	NO	-	-	NO	-	-	-	NO	-	-	14	B/L(L=R)	3	3
133	748649	NEGATIVE	POSITIVE	NEGATIVE	YES	3	290	8.4	NO	-	-	NO	-	-	-	NO	-	-	1	RIGHT	-	3
134	750798	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	8	B/L(L>R)	4	3
135	746133	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	3	13.86/2.11/10.42	NO	-	-	-	NO	-	-	14	B/L(L=R)	3	3
136	752276	NEGATIVE	POSITIVE	POSITIVE	YES	10	196	7.2	NO	-	-	NO	-	-	-	NO	-	-	14	B/L(L>R)	3	2
137	127342	NEGATIVE	NEGATIVE	NEGATIVE	YES	20	293	9.8	NO	-	-	NO	-	-	-	NO	-	-	20	B/L(L<R)	2	3
138	753441	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	174	6.6	NO	-	-	NO	-	-	-	NO	-	-	22	B/L(L=R)	3	3
139	743732	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	2	RIGHT	-	2
140	757551	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L=R)	3	3
141	759600	NEGATIVE	NEGATIVE	NEGATIVE	YES	2	269	8.8.	NO	-	-	NO	-	-	-	NO	-	-	1	RIGHT	-	3
142	761653	NEGATIVE	NEGATIVE	NEGATIVE	YES	17	248	9.6	NO	-	-	NO	-	-	-	NO	-	-	20	B/L(L=R)	2	2
143	612150	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	18.94/3.04/13.69	NO	-	-	-	NO	-	-	14	B/L(L<R)	3	5
144	763144	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	RIGHT	-	2
145	721611	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	26	RIGHT	-	1
146	764339	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	8	11.41/1.44/9.86	NO	-	-	-	NO	-	-	1	B/L(L<R)	2	3
147	757064	NEGATIVE	NEGATIVE	NEGATIVE	YES	20	231	8.4	NO	-	-	NO	-	-	-	NO	-	-	30	RIGHT	-	3
148	765720	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	YES	3	15.47/2.14/11.66	NO	-	-	-	NO	-	-	1	RIGHT	-	2
149	776442	POSITIVE	NEGATIVE	NEGATIVE	YES	20	212	6.9	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L<R)	2	3
150	767723	POSITIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	5	B/L(L=R)	2	2
151	77625	POSITIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	16.95/4.81/18.66	NO	-	-	-	NO	-	-	24	B/L(L>R)	5	3
152	491776	NEGATIVE	NEGATIVE	POSITIVE	YES	10	211	7.8	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	2	-
153	786823	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	4	-
154	388488	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	5	28	>500	NO	-	-	1	B/L(L=R)	2	2
155	788520	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	4	RIGHT	-	2
156	789937	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	6	11.49/3.01/13.97	NO	-	-	-	NO	-	-	3	B/L(L<R)	3	4
157	793972	NEGATIVE	POSITIVE	POSITIVE	YES	15	296	10.7	NO	-	-	NO	-	-	-	NO	-	-	30	B/L(L=R)	4	4
158	776008	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	22	B/L(L>R)	3	2
159	351793	NEGATIVE	NEGATIVE	POSITIVE	YES	20	251	7.9	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	4	2
160	795787	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	20	RIGHT	-	3
161	207373	POSITIVE	NEGATIVE	NEGATIVE	YES	15	234	8.6	NO	-	-	NO	-	-	-	NO	-	-	35	B/L(L>R)	3	2
162	100511	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	10	25	>500	NO	-	-	7	B/L(L<R)	2	3
163	579186	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	YES	20	18.68/2.12/13.46	NO	-	-	-	NO	-	-	30	B/L(L=R)	3	3
164	775221	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	181	7.4	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
165	814744	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	7	13.46/3.22/16.69	NO	-	-	-	NO	-	-	18	B/L(L=R)	1	1
166	242147	NEGATIVE	NEGATIVE	NEGATIVE	YES	20	234	8.4	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
167	815591	NEGATIVE	NEGATIVE	NEGATIVE	YES	4	196	7.2	NO	-	-	NO	-	-	-	NO	-	-	3	B/L(L=R)	3	3
168	785396	NEGATIVE	POSITIVE	POSITIVE	YES	2	256	9.5	YES	5	10.41/1.29/11.46	NO	-	-	-	NO	-	-	4	B/L(L=R)	2	2
169	550956	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	298	10.6	NO	-	-	NO	-	-	-	NO	-	-	20	B/L(L=R)	3	3
170	818028	NEGATIVE	NEGATIVE	NEGATIVE	YES	2	181	6.9	NO	-	-	NO	-	-	-	NO	-	-	1	B/L(L=R)	2	2
171	827740	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	20	RIGHT	-	3
172	827896	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	3
173	830403	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	236	8.8	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L>R)	3	2
174	830742	NEGATIVE	NEGATIVE	NEGATIVE	YES	25	286	10.1	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
175	830838	NEGATIVE	POSITIVE	POSITIVE	YES	5	211	7.2	YES	10	12.66/2.49/15.89	NO	-	-	-	NO	-	-	13	B/L(L<R)	2	3
176	831556	NEGATIVE	POSITIVE	POSITIVE	NO	-	-	-	YES	8	28.61/1.41/10.64	NO	-	-	-	NO	-	-	20	B/L(L=R)	3	3
177	639736	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	YES	10	28	>500	NO	-	-	2	B/L(L<R)	2	3

SERIAL NO.	MRD NO-	NAME	FATHER/ HUSBAND NAME	DATE OF VISIT	MONTH OF VISIT	AGE (YEARS)	GENDER (M/F)	WEIGHT (KG)	HEIGHT (CM)	BMI (KG/M2)	LIFESTYLE	OCCUPATION	DRIVING	DURATION (YEARS)	HOUR(S) /DAY	WRITING WORK	DURATION (YEARS)	HOUR(S) / DAY	COMPUTER USE	DURATION (YEARS)	HOUR(S) /DAY	COW MILKING	DURATION (YEARS)	TIME (HOUR(S) /DAY)	PAIN IN THUMB	PAIN IN INDEX FINGER
178	832584	JKB	AB	19-10-2019	OCTOBER	66	F	72	166	26.1	MODERATE	SERVICE-DOCTOR	YES,CAR	30	2	YES	35	3	NO	-	-	NO	-	-	NO	NO
179	832751	PK	AS	19-10-2019	OCTOBER	57	F	75	159	29.7	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	2	YES	YES
180	833435	BK	PS	21-10-2019	OCTOBER	42	F	66	162	25.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	8	1	NO	NO
181	842322	RK	JS	04-11-2019	NOVEMBER	52	F	78	159	20.9	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	25	1	YES	NO
182	192193	NB	GD	05-11-2019	NOVEMBER	38	F	89	163	33.5	MODERATE	SERVICE-BANKER	YES,SCOOTY	10	1	YES	10	4	YES	10	3	NO	-	-	YES	YES
183	562771	KK	BS	05-11-2019	NOVEMBER	34	F	68	172	23	MODERATE	HOUSEWIFE	YES,SCOOTY	5	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
184	845250	SK	AS	08-11-2019	NOVEMBER	40	F	96	160	37.5	MODERATE	SERVICE-TEACHER	YES,SCOOTY	10	1	YES	15	4	YES	5	2	NO	-	-	NO	NO
185	845566	SSS	JS	08-11-2019	NOVEMBER	66	M	75	175	24.5	MODERATE	DRIVER	YES,CAR	30	6	NO	-	-	NO	-	-	NO	-	-	NO	NO
186	459513	GR	NS	08-11-2019	NOVEMBER	66	M	80	168	28.3	MODERATE	MILK MAN	NO	-	-	NO	-	-	NO	-	-	YES	30	2	YES	YES
187	179826	S	AJ	08-11-2019	NOVEMBER	42	F	69	165	25.3	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
188	845701	FS	RS	08-11-2019	NOVEMBER	32	M	77	164	28.6	MODERATE	SHOPKEEPER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
189	140862	RK	ZK	15-11-2019	NOVEMBER	27	F	81	158	32.4	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
190	717791	PV	MV	20-11-2019	NOVEMBER	36	F	69	161	26.6	MODERATE	SERVICE-ACCOUNTANT	YES,CAR	10	2	YES	13	4	YES	13	2	NO	-	-	NO	NO
191	866129	SG	RG	14-12-2019	DECEMBER	59	F	74	160	28.9	MODERATE	SERVICE-TEACHER	YES,SCOOTY	25	1	YES	30	3	NO	-	-	NO	-	-	YES	NO
192	868003	SD	BS	17-12-2019	DECEMBER	53	M	78	171	26.7	HEAVY	LABOURER	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
193	618760	PA	VA	17-12-2019	DECEMBER	52	F	88	166	31.9	MODERATE	HOUSEWIFE	YES,SCOOTY	10	1	NO	-	-	NO	-	-	NO	-	-	NO	NO
194	868752	AR	DR	18-12-2019	DECEMBER	39	F	68	170	23.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	YES
195	409684	BD	KR	18-12-2019	DECEMBER	71	F	69	154	29.1	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	YES	40	2	YES	NO
196	842945	MK	GS	18-12-2019	DECEMBER	52	F	67	159	26.5	MODERATE	HOUSEWIFE	YES,SCOOTY	17	1	NO	-	-	NO	-	-	NO	-	-	YES	YES
197	869064	D	S	19-12-2019	DECEMBER	30	F	69	160	27	MODERATE	SERVICE-BANKER	YES,CAR	6	1	YES	6	4	YES	6	3	NO	-	-	YES	YES
198	27393	LK	PS	21-12-2019	DECEMBER	55	F	66	155	27.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
199	870250	AG	AG	21-12-2019	DECEMBER	46	F	81	163	30.5	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	NO	NO
200	873434	S	YK	28-12-2019	DECEMBER	62	F	79	158	31.6	MODERATE	HOUSEWIFE	NO	-	-	NO	-	-	NO	-	-	NO	-	-	YES	NO

SERIAL NO.	MRD NO-	PAIN IN FOREARM	LEFT/ RIGHT	SYMPTOMS INCREASED BY DRIVING	SYMPTOMS INCREASED BY WRITING	SYMPTOMS INCREASED BY COMPUTER USE	PAIN AWAKENS AT NIGHT (YES/NO)	TINGLING (YES/NO)	NUMBNESS (YES/NO)	H/O TRAUMA(YES/NO)	H/O FRACTURE(YES/NO),DETAILS-	H/O ARM SURGERY(YES/NO),DETAILS-	CLINICAL SENSORY DEFICIT	CLINICAL MOTOR DEFICIT	PHALEN TEST(RIGHT)	PHALEN TEST(LEFT)	TINEL SIGN(RIGHT)
178	832584	NO	L=R	YES	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
179	832751	NO	L=R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
180	833435	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
181	842322	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
182	192193	YES	L=R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
183	562771	NO	L=R	YES	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
184	845250	NO	L=R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
185	845566	NO	L	YES	N/A	N/A	YES	YES	YES	YES(H/O RSA 10 YEARS AGO)	YES(LEFT DISTAL RADIUS FRACTURE)	NO	NO	NO	NEGATIVE	POSITIVE	NEGATIVE
186	459513	YES	L>R	N/A	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
187	179826	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
188	845701	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
189	140862	YES	L>R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE
190	717791	NO	R	YES	YES	YES	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	POSITIVE
191	866129	NO	L<R	YES	YES	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
192	868003	NO	L<<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	NEGATIVE
193	618760	NO	L<R	YES	N/A	N/A	YES	NO	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
194	868752	YES	R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	POSITIVE
195	409684	NO	L<R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
196	842945	NO	L=R	YES	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
197	869064	NO	L<R	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
198	27393	NO	L=R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	POSITIVE	NEGATIVE
199	870250	NO	R	N/A	N/A	N/A	YES	YES	YES	NO	NO	NO	NO	NO	POSITIVE	NEGATIVE	POSITIVE
200	873434	NO	L<R	N/A	N/A	N/A	NO	YES	YES	NO	NO	NO	NO	NO	NEGATIVE	NEGATIVE	NEGATIVE

SERIAL NO.	MRD NO-	TINEL SIGN(LEFT)	DURKEN TEST(RIGHT)	DURKEN TEST(LEFT)	H/O DIABETES	DURATION (YEARS)	RBS (MG/DL)-	HBA1C-	H/O HYPOTHYROIDISM	DURATION (YEARS)	TSH (UIU/ML)/ T3(PMOL/L)/ T4(PMOL/L)	H/O RHEUMATOID ARTHRITIS	DURATION (YEARS)	RA FACTOR (IU/ML)	ANTI CCP (U/ML)	H/O HYPOCORTISOLISM	DURATION (YEARS)	S.CORTISOL (NMOL/L)	LAST PREGNANCY DURATION (YEARS)	NCV FINDING (CTS)	CTS GRADE (LEFT)	CTS GRADE (RIGHT)
178	832584	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	35	B/L(L=R)	2	2
179	832751	NEGATIVE	POSITIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	23	B/L(L=R)	2	2
180	833435	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	15.69/3.46/18.18	NO	-	-	-	NO	-	-	3	B/L(L=R)	3	3
181	842322	NEGATIVE	NEGATIVE	NEGATIVE	YES	10	288	10.4	NO	-	-	NO	-	-	-	NO	-	-	20	B/L(L=R)	2	2
182	192193	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	6	20.86/1.49/6.46	NO	-	-	-	NO	-	-	3	B/L(L=R)	1	1
183	562771	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	1	B/L(L=R)	3	3
184	845250	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	6	10.88/2.69/15.41	NO	-	-	-	NO	-	-	7	B/L(L=R)	3	3
185	845566	NEGATIVE	NEGATIVE	POSITIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	LEFT	3	-
186	459513	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	2	2
187	179826	NEGATIVE	POSITIVE	POSITIVE	YES	9	255	8.6	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L=R)	3	3
188	845701	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	B/L(L=R)	3	3
189	140862	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	7	13.69/3.24/15.86	NO	-	-	-	NO	-	-	1	B/L(L=R)	1	1
190	717791	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	3	RIGHT	-	3
191	866129	NEGATIVE	NEGATIVE	NEGATIVE	YES	15	216	8.9	NO	-	-	NO	-	-	-	NO	-	-	37	B/L(L=R)	2	2
192	868003	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	N/A	RIGHT	-	2
193	618760	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	10	18.81/2.46/18.66	NO	-	-	-	NO	-	-	20	B/L(L=R)	2	2
194	868752	NEGATIVE	NEGATIVE	NEGATIVE	YES	2	212	7.1	NO	-	-	NO	-	-	-	NO	-	-	3	RIGHT	-	3
195	409684	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	20	22.46/1.88/17.94	NO	-	-	-	NO	-	-	35	B/L(L=R)	2	2
196	842945	NEGATIVE	POSITIVE	NEGATIVE	YES	11	289	10.1	NO	-	-	NO	-	-	-	NO	-	-	10	B/L(L=R)	3	3
197	869064	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	YES	5	12.41/1.92/13.46	NO	-	-	-	NO	-	-	1	B/L(L=R)	2	2
198	27393	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	22	B/L(L=R)	2	2
199	870250	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	12	RIGHT	-	4
200	873434	NEGATIVE	NEGATIVE	NEGATIVE	NO	-	-	-	NO	-	-	NO	-	-	-	NO	-	-	26	B/L(L=R)	2	2

Baba Farid University of Health Sciences
Sadiq Road
Faridkot-151 203 (Pb). INDIA.
Phone : 01639-256232,256236
Tele/Fax : 01639-256235
Email – Examination@bfuhs.ac.in

No. BFUHS/2K19p-TH/ 10397 Date 9/9/19

The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 29.05.2019 has approved the plan of thesis of **Arpit Varshney**, a student of your college for **MD General Medicine** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis

Clinical profile in patients with carpal tunnel syndrome

Supervisor
Dr. Sandeep Puri
Prof.,
Dept. of Medicine,
DMCH, Ludhiana.

Co-Supervisor
Dr. Birinder Singh Paul
Prof.,
Dept. of Neurology,
DMCH, Ludhiana.

Dr. Rajnish Garg
Prof. & Head,
Dept. of Orthopaedics,
DMCH, Ludhiana.

The student has to submit the four copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

SP Singh
Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*
2. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF MEDICINE

IN

MEDICINE

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

NOVEMBER, 2018

DR. ARPIT VARSHNEY

DEPARTMENT OF MEDICINE
DAYANAND MEDICAL COLLEGE & HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME
For the degree of	M.D. (Medicine)
Name of the candidate	Dr. Arpit Varshney
Supervisor	Dr. Sandeep Puri, Professor, Department of Medicine, DMCH, Ludhiana
Co-supervisor(s)	Dr. Birinder Singh Paul, Professor, Department of Neurology, DMCH, Ludhiana Dr. Rajnish Garg,Professor and Head, Department of orthopaedics, DMCH Ludhiana
Institution	Dayanand Medical College and Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Carpal tunnel syndrome is a common condition that causes pain, numbness, and tingling in the hand and arm. The condition occurs when one of the major nerves to the hand — the median nerve — is squeezed or compressed as it travels through the wrist.

Risk factors for carpal tunnel syndrome include:

Female gender, elderly age, Repetitive hand use, Hand and wrist position, doing activities that involve extreme flexion or extension of the hand and wrist, Pregnancy, Diabetes, rheumatoid arthritis, and thyroid gland imbalance.

Aim of Study: To study the clinical profile in patients with carpal tunnel syndrome.

Materials & Methods: Prospective study to be conducted on patients diagnosed with carpal tunnel syndrome via NCV in DMCH, Ludhiana.

- All subjects will be selected on basis of NCV diagnosed CTS and will complete a history, clinical symptom questionnaire including age, gender, height, weight, pain, tingling, numbness, aggravating factors, relieving factors, lifestyle. The case definition of CTS will be based on positive responses on both the NCS and the clinical symptoms questionnaire.
- All subjects will be clinically examined for
- Tenderness, paraesthesia, phalen test, tinel sign.
- All subjects will be evaluated for associated risk factors like obesity, hypothyroidism, type 2 diabetes mellitus and occupations involving excessive use of hands.

Clinical Significance: A proper understanding of clinical profile of patients with carpal tunnel syndrome can lead to better understanding of epidemiology of the disease and can improve outcome of the patient. it may also lead to decrease incidences of carpal tunnel syndrome as early risk detection will become possible.

Keywords: Carpal tunnel syndrome, height, weight, BMI, hypothyroidism, obesity, female.

(Signature) Candidate	(Signature) Co-supervisor	(Signature) Co-supervisor	(Signature) Supervisor	(Signature) Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis entitled "**CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME**" exist in the Department of Medicine, Dayanand Medical College & Hospital, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis are genuine and is collected by the candidate himself under our supervision and guidance.

Supervisor

Dr. Sandeep Puri
Principal and Professor
Department of Medicine
DMCH, Ludhiana

Co-Supervisor(s)

Dr. Birinder Singh Paul
Professor
Department of Neurology
DMCH, Ludhiana

Dr. Rajnish Garg
Professor and Head
Department of Orthopaedics
DMCH, Ludhiana

Dr. Dinesh Gupta
Professor & Head
Department of Medicine
DMCH, Ludhiana

Place : LUDHIANA

Date : 20 - DECEMBER - 2018

APPROVAL PROFORMA
BY
RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Arpit Varshney
Department	Medicine
Topic of Thesis	CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME
Likely date of appearing in PG examination	MAY-JUNE 2021
Date of enrollment	MAY, 2018
Name of Head of Department	Dr. Dinesh Gupta
1) Supervisor	Dr. Sandeep Puri
2) Co-Supervisor(s)	Dr. Birinder Singh Paul Dr. Rajnish Garg

Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
1. HOD Pharmacology	1. HOD Physiology
2. HOD Surgery	2. HOD Pathology
3. HOD Pathology	3. HOD Pharmacology
4. HOD Medicine	4. HOD SPM
5. Dean Academics	5. HOD Medicine
6. Vice Principal	6. HOD Surgery
	7. HOD Obst. & Gynae.
	8. Legal Expert
	9. Secretary, IEC
	10. Dean Academics
	11. Vice Principal
	12. Principal

Approved: Yes / No

Chairperson
Research Committee
Chairperson
Research Committee

Approved: Yes / ~~No~~

Chairperson
Ethics Committee
Chairperson
Ethics Committee

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	NAME OF THE CANDIDATE AND ADDRESS	Dr. ARPIT VARSHNEY R-1/38, HOUSE NO-38, SECTOR-1, RAJ NAGAR, GHAZIABAD, UTTAR PRADESH
2	NAME OF THE INSTITUTE	DAYANAND MEDICAL COLLEGE AND HOSPITAL, LUDHIANA
3	COURSE OF STUDY AND SUBJECT	MD MEDICINE
4	DATE OF ADMISSION OF COURSE	10th MAY, 2018
5	TITLE OF THE TOPIC	CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Carpal tunnel syndrome (CTS) is a medical condition due to compression of the median nerve as it travels through the wrist at the carpal tunnel.The main symptoms are pain, numbness and tingling in the thumb, index finger, middle finger and the thumb side of the ring fingers.

Risk factors include obesity, repetitive wrist work, pregnancy and rheumatoid arthritis. There is tentative evidence that hypothyroidism [1] increases the risk.Diabetes mellitus is weakly associated with CTS. Types of work that are associated include computer work, work with vibrating tools and work that requires a strong grip.[2]

Some common conditions that can lead to CTS include obesity, hypothyroidism, arthritis, diabetes, prediabetes (impaired glucose tolerance), and trauma.

Work related

Occupational risk factors of repetitive tasks, force, posture, and vibration have been cited. The relationship between work and CTS is controversial.[3,4]

Carpal tunnel syndrome is provoked by repetitive movement and manipulating activities and that the exposure can be cumulative. Symptoms are commonly exacerbated by forceful and repetitive use of the hand and wrists in industrial occupations.

Associated conditions [2]

1.Rheumatoid arthritis –

carpal tunnel syndrome, often mild, is a common complication of rheumatoid arthritis.[5]

2.pregnancy

3.Previous injuries including fractures of the wrist.

4.Medical disorders that lead to fluid retention or are associated with inflammation such as: inflammatory arthritis, Colles' fracture, amyloidosis, hypothyroidism, diabetes mellitus, acromegaly, and use of corticosteroids and estrogens.

The carpal tunnel syndrome is frequently associated with a Colles fracture.Median nerve compression often occurs after immobilization. Nonoperative treatment to control edema, including injection of hydrocortisone into the carpal tunnel, is usually adequate in milder cases.[6]

5.repetitive activities of the hand and wrist, in particular with a combination of forceful and repetitive activities.

a.Work tasks demanding handgrip with high forces or the use of vibrating tools are associated with CTS. The association is stronger if these work tasks are accompanied by repetitive movements of the hand or wrist.[7]

b.exposure to physical work load factors, such as repetitive and forceful gripping, is probably a major risk factor for CTS in several types of worker populations.[8]

c. . A cause-effect relation between CTS and exposures to handheld vibrating tools and to work causing repetitive movements of the wrist seems probable.[9]

6.Obesity

Diagnosis

A combination of described symptoms, clinical findings, and electrophysiological testing may be used. Correct diagnosis involves identifying if symptoms match the distribution pattern of the median nerve.

Numbness in the distribution of the median nerve, nocturnal symptoms, thenar muscle weakness/atrophy, positive Tinel's sign at the carpal tunnel, and abnormal sensory testing such as two-point discrimination have been standardized as clinical diagnostic criteria.

Electrodiagnostic testing (electromyography and nerve conduction velocity)

There is excellent interpractitioner test-retest reliability of transcarpal median sensory NCV method for diagnosing CTS.[10]

Physical exam

- Phalen's maneuver is performed by flexing the wrist gently as far as possible, then holding this position and awaiting symptoms. A positive test is one that results in numbness in the median nerve distribution when holding the wrist in acute flexion position within sixty seconds. Phalen's sign is defined as pain or paresthesias in the median-innervated fingers with one minute of wrist flexion.
- Tinel's sign is performed by lightly tapping the skin over the flexor retinaculum to elicit a sensation of tingling or "pins and needles" in the median nerve distribution.
- Durkan test, carpal compression test, or applying firm pressure to the palm over the nerve for up to 30 seconds to elicit symptoms has also been proposed.

Tinel's sign is not useful in the evaluation of patients with carpal tunnel syndrome, whereas Phalen's test, which has a greater sensitivity and specificity, can be of use.[11]

Treatment

Generally accepted treatments include: physiotherapy, steroids either orally or

injected locally, splinting, and surgical release of the transverse carpal ligament.Change in activity may include avoiding activities that worsen symptoms.

6.2 REVIEW OF LITERATURE

Carpal tunnel syndrome is more than twice as common in females as it is in males, and patients aged more than 55 years are more likely to suffer from CTS. Females with CTS are more likely to work in moderate manual work and males with CTS are more likely to work in heavy office/clerical work. Obesity and CTS are related statistically.[12]

Repetitive manual work tasks involving flexion and extension at the wrist, forceful grip with the hand, and/or vibrations of the hand and arm, such as are induced (for example) by handheld vibrating tools, can damage the median nerve and cause CTS. A combination of these exposures has been found to raise the risk of CTS with a more than additive effect. Working at a computer keyboard seems not to raise the risk of CTS.[13]

The mean age and female/male gender ratio (37.4 years; F:M = 1.2:1) of the occupational carpel tunnel syndrome population reported here differ dramatically from that reported for non-occupational carpal tunnel populations (51 years; F:M = 3:1). These clear demographic differences between the occupational and non-occupational CTS populations, aswell as the magnitude of numbers reported here, would appear to support the concept that workplace exposures may be responsible for a substantial proportion of physician-reported carpal tunnel cases.[14]

CTS is a very common disorder of pregnancy. Recent evidence points to both a higher prevalence of symptoms as well as electrophysiological nerve changes that occur even in asymptomatic women. While most women experience symptomatic improvement following delivery, a significant percentage may still have some complaints and continue to wear splints.[15,16]

Rahmanshiri et al conducted a study in which meta-analysis was limited to the studies that controlled their estimates for some potential confounders, the association between a thyroid disease and CTS disappeared (N = 4,799, ES = 1.17 [95% CI, 0.71–1.92], I2 = 0%), and the effect size for hypothyroidism largely attenuated (N = 71,133, ES = 1.44 [95% CI, 1.27–1.63], I2 = 0%).[17]

Increase in BMI is an important risk factor for CTS in hypothyroidism and clinical evidence of CTS is a very sensitive parameter for the same.[18]

Stevens JC et al conducted a study which aimed to assess the magnitude of the association between hypothyroidism and carpal tunnel syndrome (CTS). Eighteen studies were included in a random-effects meta-analysis. A meta-analysis of the studies that did not control their estimates for any confounder showed an association between a thyroid disease (hypo- or hyperthyroidism) and CTS (N = 9,573, effect size [ES] = 1.32 (95% confidence interval [CI], 1.04–1.68) and between hypothyroidism and CTS (N = 64,531, ES = 2.15 [95% CI, 1.64–2.83]).

In 43.2% of the 1,016 patients, no associated conditions were found on review of the medical records, whereas associated conditions were documented in 56.8%. The most frequent of these conditions were Colles' fracture, rheumatoid arthritis, hormonal agents or oophorectomy (or both), diabetes mellitus, and, among men, occupations that involved excessive use of the hands. Rheumatoid arthritis, diabetes mellitus, and pregnancy were significantly more frequent among the study patients with carpal tunnel syndrome than in the general population. [2]

Incidence rates increase with age for men, whereas for women the rates peak

at 45-54 years. Prevalence among older people is almost four times greater for women than for men.[19]

Female gender, obesity and age are independent RF for CTS. DM may be a weak RF, especially among women.[20]

Individuals with a higher BMI are at increased risk for CTS. Highest prevalence of CTS is in the age group 45-65 years and that women are at a higher risk than men for CTS.[21]

BMI is an independent risk factor for CTS in both genders. Hand and wrist anthropometrics were found to be independent risk factors for CTS in females, but not in males.[22]

6.3 AIMS AND OBJECTIVES OF THE STUDY

To study the clinical profile in patients with carpal tunnel syndrome.

7. MATERIALS AND METHODS

7.1 Source of Data

Data will be sourced from consenting adult patients(>18yrs) of either gender visiting OPDor admitted in DMCH Ludhiana with confirmed diagnosis of carpal tunnel syndrome by Nerve Conduction Velocity.

METHODOLOGY

•All subjects will be selected on basis of NCV diagnosed CTS and will complete a history,clinical symptom questionnaire including age,gender,height,weight,pain,tingling,numbness,aggravating factors,relieving factors,lifestyle. The case definition of CTS will be based on positive responses on both the NCS and the clinical symptoms questionnaire.

•All subjects will be clinically examined forTenderness,paraesthesia, phalen test, and tinel sign.

•All subjects will be evaluated for associated risk factors like obesity,hypothyroidism,type 2 diabetes mellitus, and occupation involving excessive use of hands.

OUTCOME

To determine clinical profile in patients with carpal tunnel syndrome.

STATISTICAL ANALYSIS

Data will be described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate.All statistical calculations will be done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

This study does not require any intervention to be conducted on the patient. Only those interventions are required for study which are essential for diagnosis and clinical management of the patient.

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached along with

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PERFORMA FOR CARPAL TUNNEL SYNDROME-

S.NO-

NAME-

FATHER'S NAME-

MRD NO-

ADMN NO-

DATE OF ADMISSION(IPD PATIENTS)/VISIT(OPD PATIENTS) IN DMCH-

CONTACT INFO-

PERSONAL DETAILS=

1. AGE-

2. GENDER-

3. WEIGHT(KG)-

4. HEIGHT(METRES)-

5.BMI(KG/M^2)-

4. LIFESTYLE (SEDENTRY,MODERATE,HEAVY)-

5. OCCUPATION-

DOES IT INVOLVE
A. DRIVING- YES/NO
B. WRITING- YES/NO
C. COMPUTER USE- YES/NO
D. COW MILKING- YES/NO IF YES,NUMBER OF HOURS OF MILKING-

Signature of Candidate **Signature of Supervisor**

CHIEF COMPLAINTS-

PAIN IN THUMB,INDEX,FOREARM- YES / NO

PAIN AGGRAVATED BY- 1.DRIVING-YES /NO /N.A
2.TYPING-YES/NO/N.A

PAIN AWAKENS AT NIGHT- YES / NO

TINGLING- YES / NO

NUMBNESS- YES / NO

H/O TRAUMA- YES/NO DETAILS-

H/O FRACTURE- YES/NO DETAILS-

H/O ANY ARM SURGERY- YES/NO DETAILS-

EXAMINATION-

GENERAL PHYSICAL EXAMINATION-

APPEARANCE- SENSORIUM-

VITALS-

HR- RR- BP- TEMPERATURE-

PALLOR- ICTERUS- CYANOSIS-

EDEMA- JVP- CLUBBING-

LYMPHADENOPATHY-

Signature of Candidate **Signature of Supervisor**

SYSTEMIC EXAMINATION-

CNS-

	RIGHT ARM	LEFT ARM
UPPER LIMB-		
I. WASTING OF THENAR EMINENCE-		
II.MOTOR-A.TONE		
B.POWER		
III.SENSORY- A.PAIN		
B.TOUCH		
C.TEMPERATURE		
D.VIBRATION(ON RADIAL STYLOID PROCESS)		
E.PROPIOCEPTION-		
a.thumb		
b.wrist		
III.REFLEXES- A.BICEPS REFLEX		
B.TRICEPS REFLEX		
C. SUPINATOR REFLEX		
IV.LOCAL EXAMINATION- i.TENDERNESS		
ii.PROVOCATIVE TESTS-		
a.PHALEN TEST-		
b.TINEL SIGN-		
c.DURKEN TEST-		

Signature of Candidate **Signature of Supervisor**

V.OTHER-

CVS-

RESPIRATORY-

P/A-

Signature of Candidate

Signature of Supervisor

RELEVANT INVESTIGATIONS DONE-

DATE	
Hb (g/dl)	
TLC (X 10^3/ul)	
DLC	
PLATELETS (X10^3/ul)	
ESR	
GLUCOSE (X 10^3/ul)	
UREA (mg/dl)	
CREATININE (mg/dl)	
Na/K/Cl (mEq/l)	
Ca/PO4/Mg (mg/dl)	
T.BILIRUBIN (mg/dl)	
D.BILIRUBIN (mg/dl)	
SGOT (U/L)	
SGPT (U/L)	
ALP (U/L)	
T.PROTEIN (g/dl)	
ALBUMIN (g/dl)	
PTI-INR	

Signature of Candidate

Signature of Supervisor

OTHER INVESTIGATIONS(WHEREVER APPLICABLE)-

1.TSH-

T3-

T4-

2.RANDOM BLOOD SUGAR-

GLYCOSYLATED HEMOGLOBIN-

3.RHEUMATOID FACTOR-

4. SERUM. CORTISOL-

NCV FINDINGS-

Signature of Candidate

Signature of Supervisor

INFORMED PATIENT CONSENT

Date: _____

I.....D/o, W/o, S/o.....

am willing to participate in the study **"CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

.....
Signature of the Witness

Name:

.....
Signature of the patient

Signature of Candidate

Signature of Supervisor

मरीज अनुमति फार्म

तिथि _____

मैं _____ पत्नी/पुत्र/पुत्री _____

निवासी _____

इस शोधकार्य "**CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME**" में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____

गवाह के हस्ताक्षर

नाम:

_____

रोगी के हस्ताक्षर/अंगूठे का निशान

नाम:

_____

अन्वेषक के हस्ताक्षर

_____

विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ _____

"CLINICAL PROFILE IN PATIENTS WITH CARPAL TUNNEL SYNDROME" ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

_____
ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ

_____
ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____

ਮਿਤੀ_____

ਪਤਾ _____

ਪਤਾ _____

_____
ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

_____
ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ